

No. 11631

United States
Circuit Court of Appeals
For the Ninth Circuit.

NATIONAL MOTOR BEARING CO., INC., a
Corporation,
Appellant,
vs.

CHANSLOR & LYON CO., a Corporation,
Appellee.

Transcript of Record
In Three Volumes
Volume II
Pages 241 to 509

Upon Appeal from the District Court of the United States
for the Northern District of California,
Southern Division

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(Testimony of Lloyd A. Johnson.)

you testified was tested in your plant. How was that test concluded? Was it satisfactory or not?

A. Yes, it was.

Q. Does your company have, or do you have maintained a file of patents issued on oil seals adapted for insertion to seal the annular space between the shaft and the bore in the housing?

A. Yes.

Q. Are those files kept under your direction?

A. Yes.

Q. Have you recently examined those files?

A. Yes.

Q. Where did you do that?

A. Well, in my office and in your office.

Q. About how many patents are there on oil seals for insertion to seal the annular space between the shaft and a bore in the [226] housing?

A. Over a thousand.

Q. Did you examine each of those patents?

A. Yes.

Q. About how many of those patents in that thousand are being used commercially today?

A. Approximately twenty.

Q. Among those twenty patents is there any patent covering a unitary, synthetic, rubber, bonded seal construction?

Mr. Haight: I object to that, if the Court please. That is much too general. We ought to deal with specificities on a question like that.

Mr. Owen: He can cross-examine.

Mr. Haight: Of course I can cross-examine, but

(Testimony of Lloyd A. Johnson.)

if you have anything specific you should call attention to it.

Mr. Owen: I will ask another question.

The Court: Very well.

Q. (By Mr. Owen): Besides the patent in suit, do you find among those twenty patents any patents covering unitary synthetic rubber bonded seal construction? A. Yes.

Q. What patent was that?

A. The patent to Heinze, No. 2,240,332.

Q. Are those the two patents you found among the twenty that are being used commercially of that description? A. Yes.

Mr. Owen: I would like to offer in evidence this patent as plaintiff's exhibit next in number.

Mr. Haight: This is a patent applied for in 1939 and issued in 1941. I shall cross-examine him upon the claim of it. [227] I will go into it. Let it be admitted.

The Court: Very well.

(Patent marked Plaintiff's Exhibit No. 24.)

[Plaintiff's Exhibit 24 appears in book of exhibits.]

Q. (By Mr. Owen): Was the patent in suit which is earlier in date than this Exhibit 24, the first commercially successful unitary synthetic rubber bonded seal construction? A. Yes.

Q. Are you acquainted with the patents of the Victor Manufacturing and Gasket Company?

A. Some of them.

(Testimony of Lloyd A. Johnson.)

Q. Do you know how many patents they have on oil seal construction?

Mr. Haight: I object to that as utterly immaterial to any issue in this case.

Mr. Owen: Mr. Haight, let me say what I am trying to prove and maybe we can agree. It was according to our books there were about fifty-six patents for oil seals for this type of sealing. Of those they are using about four in their commercial practice. That is our purpose.

Mr. Haight: Do you want me to admit for purposes of this case they are invalid? If so, I will admit that.

Mr. Owen: I am not asking for that.

The Court: You won't stipulate to the statement made by Mr. Owen?

Mr. Haight: I don't know whether it is true or not, but I will let it go in on that basis.

The Court: Very well. [228]

Mr. Owen: What we are trying to state that on these oil seals it is rarely you get a happy combination that works. There are over a thousand patents in the art and yet very few are actually successful, a commercial success.

Q. To your knowledge has the Type H and the Type A device of the defendant had a substantial and large commercial success? A. Yes.

Q. Mr. Johnson, will you turn to the patent to Gits, 2,052,762? Have you read and do you understand that patent? A. Yes.

(Testimony of Lloyd A. Johnson.)

Q. Have you also read the depositions that were taken in the East in connection with that patent?

A. Yes.

Q. In that Gits structure the sealing member, which is number 5 in Figure 2, is that vulcanized before insertion in the cup member? A. Yes.

Q. That is a separate operation? A. Yes.

Q. And then is that sealing flange brought to another station for assembly? A. Yes.

Q. And how is that sealing flange held in the cup?

A. The sealing flange is placed in the cup, 1, at the recess corresponding to the larger diameter of the sealing flange. Then ring 12 is inserted as shown in Figure 1 and then expanded against the edges of the outer case. In other words, the ring is stretched outwardly to pinch the sealing flange against the outer edge.

Q. In the oil seal there is what kind of hold? What is that [229] called?

A. We call that a clamping action.

Q. Is the device described in the Gits patent like the device described in the Johnson patent in suit where the composition is bonded to the cup member by vulcanization in a single operation?

A. No.

Q. In this Gits structure, this flange 8, does that lay against this inset flange 4? A. Yes.

Q. Is it held against there in any way when it is assembled? A. No.

(Testimony of Lloyd A. Johnson.)

Q. Is there any flange on the back side of that or any flange on the sealing member on the back side of the inset flange 4? A. No.

Q. Was this Gits seal a commercial success?

A. It was a failure.

Mr. Haight: I move all of those answers to each of those questions be stricken as conclusions in answer to leading questions.

The Court: Then you should have objected on the ground that the questions were leading before the witness answered. If he answers the question, it may be that there is a question of the weight of the evidence; but having once come in without objection, I don't think that is a proper ground to make a motion like that at this time.

Mr. Haight: I think your Honor is right.

The Court: I will deny the motion. [230]

Mr. Haight: On the question of weight, such questions and such answers can't have any weight.

Mr. Owen: Mr. Haight, they are no more leading than your questions to Mr. Aukers. The record will show that.

Q. Do you find in the Peterson patent, No. 2,114,908, the structure of the patent in suit?

Mr. Haight: I object to that question on the ground it is calling for the conclusion of this witness, which witness is offered as a patent expert, and I move it be stricken.

The Court: Are you going to pursue it further?

Mr. Owen: Yes, I am.

(Testimony of Lloyd A. Johnson.)

The Court: Counsel is going to pursue it further. The question is harmless, then.

Mr. Owen: What we are doing here is not presenting a matter for a patent expert. He is simply comparing structures, as I understand it.

Q. Do you find in Peterson, in Figure No. 5, the same kind of a cup member as in the Chandler patent?

Mr. Haight: I object to that as calling for a comparison and a conclusion.

The Court: Why don't you ask him, Mr. Owen, if there are any differences, and if so, to state them. Wouldn't that be a fair question?

Mr. Owen: I understand it is perfectly proper and important; that it is necessary to explain the patents for both [231] parties, admitting and identifying similarities between the prior art.

The Court: I think that perhaps the question does call for the conclusion of the witness. With my meager knowledge I am supposed to arrive at the conclusion that you are asking of the witness, but it would be better to ask him the details, or if you can, by a general question ask if they are the same, and if so, stating, or state the particulars in which they are different and let me endeavor to draw the conclusion as to whether they are the same or different.

Mr. Owen: Thank you, your Honor.

Q. Referring to this Peterson patent and comparing it with a Chandler patent, No. 1,905,800, Fig-

(Testimony of Lloyd A. Johnson.)

ure 5 of the Peterson patent, is that the same or different than the construction shown there?

A. The face is substantially the same. It has a periphery. It has a radial flange offset axially just like the Chandler patent.

Q. Was this Peterson patent a commercial success. A. No.

Q. And now, the Chandler patent, No. 1,905,800; do you find in there the structure of the Johnson patent in suit? A. Part of it.

Q. What do you find?

A. I find the outer case member, the radial flange with an axially offset portion.

Q. Is that all you find there of the patent in suit— [232]

A. There is a sealing member.

Q. Is that like it is in the patent in suit?

A. No.

Q. How is the sealing member held in the Chandler patent?

A. This one is clamped into place between the axial inwardly offset flange and the outer case.

Q. Will you turn to the next patent? This is the patent to Winter, No. 2,089,461; do you find in that patent all or part of the structure of the patent in suit? A. Part of the patent in suit.

Q. What do you find?

A. It has the outer case member; it has the metal radius, I mean, radial flange with an axially offset member, several of them, in fact, and it has

(Testimony of Lloyd A. Johnson.)

a sealing member which is clamped between two axial members.

Q. Is that sealing member secured as it is in the patent in suit? A. No.

Q. Before you leave Winter, is that case, with the peripheral flange and the radial flange the offset portion alike, or substantially different from the Figure 3 of Chandler?

A. It is quite similar.

Q. Will you turn to the next patent? Is Fitzgerald alike, or substantially like the patent you have been talking about to Winter or Chandler?

A. Yes.

Q. Would your testimony be the same with regard to that patent as the others you have been talking about?

A. Substantially the same. [233]

Q. Now, this morning, Mr. Aukers, on cross-examination proposed a reconstruction of this Frumveller seal in order to make it a seal on a shaft. Do you find from your examination of the Frumveller specifications any instructions in there to reconstruct the seal as he proposed? A. No.

Q. Did the Frumveller seal, which is—withdraw that. What type of seal would you call that Frumveller seal?

A. I would say this falls in the classification in what is known as a face seal.

Q. As distinguished from what?

A. As distinguished from a shaft seal.

Q. And the patent in suit deals with what?

(Testimony of Lloyd A. Johnson.)

A. The patent in suit deals with a shaft seal.

Q. Would the seal on this Frumveller patent, Figure 4, used with a ball on the shaft as Mr. Aukers proposed, be a shaft seal or a face seal?

A. It would be a face seal.

Mr. Owen: Would you read the question to the witness, please.

Mr. Haight: The witness made the wrong answer.

(Question read.)

A. I missed this Mr. Aukers' proposition.

Q. (By Mr. Owen): Which would it be?

A. As Mr. Aukers suggested in the revision and redrawing of this patent, it would be a shaft seal.

Q. Are you referring to the sketch he made above Figure 4 there? [234] A. Yes.

Q. He made a second proposal that you place a shaft right through the middle of it and take that ball 3 and incorporate that as part of the shaft. In that case where the ball would rotate with the shaft, what type of a seal would Frumveller be?

A. A face seal.

Q. Do you find in the Frumveller patent an oil seal of the type adapted for insertion to seal the annular space between the shaft and a bore in the housing? A. No.

Q. How is the Frumveller held in?

A. This is clamped between two parts of what

(Testimony of Lloyd A. Johnson.)

appears to be the housing. It is not confined within the housing. The diaphragm member——

Q. Number what?

A. 43—this housing is split, and in the split in the housing the two ends of that housing butt up and pinch this diaphragm, which is 43, colored red.

Q. Do you find in Frumveller a cup member having a peripheral portion? A. No.

Q. Do you find there a cup member having an axially inwardly offset radial flange?

A. No, and I don't find the resilient.

Q. Will you take the next patent in this book of charts, the patent to Penick, No. 1,817,095? Was that patent before the Patent Office when your patent was solicited? A. Yes.

Q. And cited as a reference? A. Yes.

Q. Do you find in there any cup member having a peripheral [235] portion and an axially inwardly offset radial flange? A. No.

Q. Now, taking the patent to Miller, No. 2,004,669, in Figure 5, do you find in that Miller patent a sealing member, a molded resilient sealing member bonded to both sides of said radial flange, substantially like the one in the Penick patent, which the file wrapper referred to in Figure 5 of Miller?

A. Similar.

Q. Do you find in Miller a cup member having a peripheral portion and an axially inwardly offset radial flange? A. No.

Q. Do you find there an oil seal of the type

(Testimony of Lloyd A. Johnson.)

adapted for insertion to seal the annular space between the shaft and a bore in the housing?

A. No.

Q. Will you turn to the next? A. Yes.

Q. That is the Heinze patent, No. 2,071,403, and another Heinze patent, No. 2,116,240. Let us deal with those together, because they are substantially the same. Do you find in this Heinze patent an axially inwardly offset radial flange? A. Yes.

Q. Is that substantially the construction of Figure 3 of the Chandler patent, No. 1,905,800?

A. Yes.

Q. Do you find in the Heinze patent, or either of the Heinze patents, the molded resilient sealing member bonded to both sides of said radial flange of said offset so that its outer radial face lies within the radial plane of the cup bottom where it bends inward to form said offset? A. No.

Q. Now, we turn to the Lord patent, No. 1,996,210, is that [236] for an oil seal? A. No.

Q. Is it for an air seal? A. No.

Q. What is it for?

A. It is a vibration dampener.

Q. Do you know of any oil seal manufacturer who makes them? A. No, I don't.

Q. I call your attention to the Exhibit AAE, comprised of three parts, which are said to be illustrative of the structures of the patent, and having in mind both the patent structures and those physical structures, do you find there an oil seal of the

(Testimony of Lloyd A. Johnson.)

type adapted for insertion to seal the annular space between the shaft and a bore in the housing?

A. No.

Q. Do you find there a cup member having a peripheral portion and an axially inwardly offset radial flange.

A. No.

Q. Would the device of this Lord patent function as an oil seal?

A. No.

Q. Is the device of this Lord patent any different particularly than Penick so far as showing bonding to a flange?

A. Please repeat that question.

(Question read.)

A. Yes, it is different.

Q. How?

A. Well, in the Penick patent it shows the sealing member bonded, apparently by the vulcanizing process to the part that holds it, 6. In the Lord patent the rubber member 16, in Figure 8, shows to be clamped in position.

Q. Now, will you turn to the next patent, the Anderson patent: [237] Is that substantially the same construction as the Chandler patent, No. 1,905,800?

A. Yes.

Q. Were they owned by the same company and developed by the same company? Look at the top of the patent and you can tell.

A. Yes, the same company.

Q. Will you take the next patent? In this patent to Godley, No. 1,040,308, do you find there an oil seal of the type adapted for insertion to seal

(Testimony of Lloyd A. Johnson.)

the annular space between the shaft and a bore in the housing? A. No.

Q. Do you find there a cup member having a peripheral portion and an axially inwardly offset radial flange? A. No.

Q. Do you find there a molded resilient sealing member bonded to both sides of said radial flange at said offset so that its outer radial face lies within the radial plane of the cup bottom where it bends inward to form said offset? A. No.

Q. Will you turn to the next patent? This patent hasn't been mentioned by the defendant. I don't know whether to take the time to describe it or not.

Mr. Haight: I am relying on all of those patents that are mentioned.

Mr. Owen: You are relying on them?

Mr. Haight: Yes, and I intend to use them in argument.

Mr. Owen: Thank you, Mr. Haight.

Q. Will you turn to this Looek patent, No. 1,740,-929.

A. The sealing member in this case is a relatively thick [238] leather washer in which on one face a groove has been turned around the center hole and a coil spring is used to contract that leather so it will seal the shaft.

Q. Do you find in that Looek structure an oil seal of the type adapted for insertion to seal the annular space between the shaft and a bore in the housing? A. No.

Q. Do you find there a cup member having a

(Testimony of Lloyd A. Johnson.)

peripheral portion and an axially inwardly offset radial flange? A. No.

Q. Do you find a molded resilient member bonded to both sides of the radial flange?

A. No.

Q. The Lee patent, No. 1,862,153, would you refer to your copy of that and explain what that is?

A. That was comprised of a pair of opposed members.

Q. What was it used for?

A. It is a pipe joint. It appears to have the functions of a gasket.

Q. Now, then, will you hold this enlargement and state whether or not you find there an oil seal of the type adapted for insertion to seal the annular space between the shaft and the bore in the housing? A. No.

Q. Do you find there a cup member having a peripheral portion and an axially inwardly offset radial flange? A. No.

Q. Do you find there a molded resilient sealing member bonded to both sides of said radial flange?

A. No.

Q. Will you turn now to the next patent? This patent is also not described by the defendant's expert. This is the [239] patent to Larsh, No. 2,000,341. What does that show, Mr. Johnson?

A. A grease seal for bearings.

Q. What kind of a seal is that called?

A. It is a seal that seals within itself, apparently.

(Testimony of Lloyd A. Johnson.)

Q. Is it a shaft seal or a face seal or what other kind of seal is it? A. It is a face seal.

Q. When you say it is a face seal, will you just enlarge on it a little?

A. I mean that in a face seal——

Q. Referring to Figure 3, the one that is colored.

A. This blue part represents the shaft?

Q. No, that represents the sealing element.

A. This blue part?

Q. Yes.

A. I would have to study this patent.

Q. Do you want to refer to your copy of it?

A. I thought it had no bearing on it. Now, what was the question?

Q. I would like you to explain how that seal operates and what type of seal it is.

A. This seal?

Q. You are referring now to Figure 8.

A. Whatever this—yes, I am referring to Figure 8. This seal has a diaphragm member within it which creates axial pressure and seals in an axial direction rather than on the shaft.

Q. In that respect it is like Frumveller, a face seal? A. In that point it is.

Q. Will you refer to Figure 3 and Figure 7, both of which have been colored on this exhibit, and explain if you find [240] there an oil seal of the type adapted for insertion to seal the annular space between the shaft and the bore in the housing?

A. No.

(Testimony of Lloyd A. Johnson.)

Q. Do you find there a cup member having a peripheral portion and an axially inwardly offset radial flange? A. Yes.

Q. In that respect is that offset radial flange substantially similar to Figure 3 of Chandler, No. 1,905,800? A. Yes.

Q. Then, do you find a molded resilient element bonded to both sides of the radial flange at said offset so that its outer radial face lies within the radial plane of the cup bottom where it bends inward to form said offset, referring to Figure 3?

A. Would you read that again?

Q. Then, do you find a molded resilient sealing member bonded to both sides of said radial flange, at said offset so that its outer radial face lies within the radial plane of the cup bottom where it bends inward to form said offset? A. Yes.

Q. Do you find that on Figure 7?

A. Yes, on Figure 7.

Q. The patent to Oldberg, No. 2,094,160—what kind of a seal is that? A. That is a face seal.

Q. As distinguished from what?

A. As distinguished from a shaft seal. It seals on a face rather than on a shaft.

Q. And the pressure for the sealing is created how? A. Axial pressure.

Q. Created how?

A. By a spring which gives an axial force to it.

Q. Do you find there in that Oldberg structure an oil seal of the type adapted for insertion to seal

(Testimony of Lloyd A. Johnson.)

the annular space between the shaft and a bore in the housing? A. No.

Q. Do you find there a cup member?

A. No.

Q. Do you find there a peripheral portion——

A. No.

Q. ——on a cup member? A. No.

Q. Do you find there an axially inwardly offset radial flange? A. No.

Q. Is that all of the patent?

A. I think that's all.

Q. Reference has been made to the “whereby” clause in the claim in suit, and I hand you Exhibit 3 which is the electric motor with the gear reducing unit, and ask you if you will explain what that “whereby” clause means: It reads:

“Whereby said molded material is protected from wear by contact with adjacent moving parts.”

What is that describing?

A. I need that to describe it.

Q. You are referring now to Exhibit 9?

A. Yes.

Q. And Exhibit 3?

A. And Exhibit 3. The protection to the sealing member arises out of the fact that the sealing member is set in. Now, when it is applied, when the seal is applied to a shaft, or in an application of this type as in motor with a gear reduction unit, or in just a gear reduction unit, this shaft drives something, some other piece of equipment. [242]

(Testimony of Lloyd A. Johnson.)

Q. You mean the shaft coming out of the end?

A. The shaft coming out of the end of the gear reducing drives some piece of machinery. It may take the position where a gear would be attached to this shaft or a pulley and either through some means that power would be transmitted to another piece of equipment—assuming a pulley is on here, it is better engineering, and according to our patent to keep that pulley from touching the seal so that when the pulley revolves with this shaft, the sealing becomes stationary and it won't rub against the sealing member and cause injury to that sealing member. In this particular type of seal shown here——

Q. In Exhibit 3?

A. Yes, the sealing member is not exposed. It is protected by a shell that has a radial flange to it, but in this type of seal and as the one in the patent in question, without it being set inwardly, it has no protection. In other words, if this sealing member were attached to the straight portion of the case and being bonded on both sides the sealing member would stick out and therefore the adjoining parts would touch it and could injure it. Then, however, that is just one phase of the value of having this offset radial flange. There are hundreds of thousands of gear reducer units and applications of that type where it is good engineering practice to keep it from being injured.

Mr. Owen: You may cross examine. [243]

(Testimony of Lloyd A. Johnson.)

Cross-Examination

By Mr. Haight:

Q. You have just said in referring to Plaintiff's Exhibit 3 that there are hundreds of thousands of applications of that type and it is a good thing to keep the oil seal from being injured. Does any good engineer ever put an oil seal up against a moving part on a shaft? Do you know a good engineer who ever did that? A. Yes.

Q. Name him?

A. Ford Motor Company.

Q. In what?

A. The Ford automobile.

Q. Name another. A. Who did?

Q. You said hundreds of thousands. Here we have one, and I will let you off with ten.

A. I said there are hundreds of thousands of gear reducing units being built.

Q. But can you tell me any more cases where you get any function whatever of that last claim of the Johnson patent in suit. You have named one application, now, out of the hundred thousand and I will let you off if you can name ten, because I don't want to spend the time going through a hundred thousand.

A. You are speaking of applications?

Q. Yes, sir, and I am not speaking of what you say that it is a good thing to keep the oil seal away from a moving part. Every engineer knows that, don't they? A. In most cases they do.

(Testimony of Lloyd A. Johnson.)

Q. Why certainly they do. Now, go on with your one hundred thousand applications.

A. Here is one, that hundred [244] thousand.

Q. Is that one?

A. I am speaking of an application now.

Q. Does that illustrate one?

A. I say it does.

Q. Where?

A. Right at the end where the shaft comes out of the housing.

Q. What moving part is that adjacent to?

A. I don't know.

Q. Of course you don't. Why, then, do you say it is?

A. Because whatever is attached to this shaft can move.

Q. There is nothing attached, is there?

A. Not in this drawing there is not.

Q. An engineer who is not an engineer could be, or could put something up to engage it, couldn't he?

A. Yes.

Q. Would you say that any good engineer would do so? A. I said in my testimony before that, a pulley could be mounted on this shaft.

Q. Certainly you could. But out of the hundred thousand applications where you say there is an adjacent moving part to an oil seal, you have named one. Let us proceed. I will let you off with three out of one hundred thousand.

A. The pinion in the Packard automobile.

(Testimony of Lloyd A. Johnson.)

Q. The pinion in the Packard automobile?

A. Yes.

Q. What model—twenty-five years ago?

A. No, within the art we are talking about.

Q. You are staking your reputation as an engineer on that?

A. I don't have any reputation as an engineer to stake. [245]

Q. I thought not. Name the third one.

A. They are used as spacing elements.

Q. As spacing elements? A. Yes.

Q. To space what?

A. Spicer used one as a spacing element.

Q. In what? A. In a transmission.

Q. Now, let us stick to the other one phase: You say there are two applications you know of out of one hundred thousand that you said before. Can you name any more than two.

A. Aren't you taking my word one hundred thousand when I spoke of one hundred thousand gear reducers. That is what I said.

Q. One hundred thousand applications?

A. If there are one hundred thousand—

Q. So, all you meant was that there were one hundred thousand gear reducers, is that right?

A. That's right.

Q. I will let it go at that. It is agreed there are one hundred thousand gear reducers, and that is what you meant to tell the Court?

A. That is what I said to the Court.

(Testimony of Lloyd A. Johnson.)

Q. All right. You made reference to the file wrapper in your testimony this morning and I understood that you read a paragraph from page seventeen of that document, which is Defendant's Exhibit AAA. May I read the same?

"The Penick reference is of no greater value than Walker as showing that bonding is not new."

Is that what you read?

A. It sounds like it. [246]

Q. And that was your position in the patent office that bonding within the meaning you were trying to give it was not new; it was not new, was it? A. No.

Q. "As before stated, the basis on which the present case rests is believed to be one of the structure of the various parts entering into the seal."

At the time that was made, that was in this application and it is dated back to April 26, 1937. No claims were allowed in that application at that time, were there; that's right, isn't it?

A. No, that is correct.

Q. And then you made an affidavit, do you remember that, in this same document, page twenty-two and twenty-three and twenty-four, subscribed to on the 18th day of December, 1937. That is your affidavit appearing in this file wrapper, is it not?

A. It is my signature all right, but I don't know whether it is an affidavit.

(Testimony of Lloyd A. Johnson.)

Q. I understood you to say in response to counsel's question that you are familiar with the file wrapper. A. Yes, I now see it is.

Q. Yes, all right. Did you know at the time you made that affidavit the date of the drawings you produced here this morning.

A. I don't recall.

Q. I notice in the affidavit that you said, and I am now reading from page twenty-two:

“That he conceived of the idea for an Oil Seal for use [247] in sealing the space between a shaft and the hole through which it projects, consisting of a cup member having a peripheral portion for press-fit leak-tight engagement with the wall of said hole and an inwardly projecting perforated flange portion, and a sealing member composed of moldable material bonded to said flange so as to embed said perforated flange in its radial portion and having a sealing lip depending therefrom, prior to December 14, 1935.”

But you knew when you made that affidavit what the date was, did you?

A. I don't know whether I did or not.

Q. Do you know why you simply stated prior to December 14, 1935?

A. No, I don't.

Q. You know that was the date of the Gits patent, don't you?

A. I have no recollection of it.

(Testimony of Lloyd A. Johnson.)

Q. But at that time either you did or did not know the date you have given this morning, don't you?

A. I either did or I didn't.

Q. Do you remember which it was?

A. No.

Q. Can you give me any explanation now as to why you, in making an affidavit to the Patent Office, left it so vague as that, simply "prior to December 14, 1935"?

Can you give me any answer?

Mr. Owen: If your Honor please, I don't want to interrupt Mr. Haight, but Mr. Haight should know you never have to disclose [248] the real date.

Mr. Haight: That is not my practice. When the rule says to give an actual date, we give it.

Mr. Owen: I would like to see that rule.

Mr. Haight: There is not a rule, but it has to do with the credibility of the witness and also has to do with his frankness.

Q. It is also said in that affidavit, and I ask counsel to observe while I read so there will be no question about the accuracy of my reading, and I begin at the bottom of page twenty-two:

"That these sketches disclose structures illustrated in the drawings of the above-entitled application and set forth in claim eight which is as follows,"

and then claim eight is given.

You know, do you not, that you cancelled that claim, that you said was applicable to these structures? You know that, don't you?

(Testimony of Lloyd A. Johnson.)

A. I would have to have the document to look at to tell.

Q. That is correct, isn't it?

A. It probably is. Can you tell me the claim that was allowed, what number that was?

Q. That was number fifteen and that was filed after this affidavit.

A. All right, I agree with that, then.

Q. All right. So the thing that was embodied by the drawings you had then, as covered by claim eight, are those in respect [249] to which as far as claim eight is concerned, you cancelled, didn't you?

(No answer.)

Mr. Haight: How many drawings are there? I would like to know so I may examine on them, how many were offered by the witness—four or five?

Mr. Owen: Five.

Mr. Haight: Five with the sketch?

Mr. Owen: Four and the blueprint.

Mr. Haight: Will you give the witness——

Mr. Owen: Exhibit 20 was the blueprint.

Mr. Haight: Will you give the witness a copy. It would be very helpful if I could have the exhibit numbers. They are all Exhibit 23.

Mr. Owen: Except that blueprint, Mr. Haight, which is——

Mr. Haight: Yes, I will get to that one.

Q. Two of these in the exhibit to which I have just referred depict molds, do they not?

A. Yes.

(Testimony of Lloyd A. Johnson.)

Q. Will you read the legends upon them so that we will know definitely those two I am about to eliminate?

A. "Mold" and "Top"—is that what you mean?

Q. That is what I mean.

A. "A Mold Bottom"?

Q. O.K. Now, I want you to look at the other two in that exhibit—the oil assembly and the one entitled "outer case." I notice that on these on the bottom we find the legend, EX314 and EX317. What does that mean—"experiment"?

A. Right. [250]

Q. You made a test, did you not? Was there a report made on that test? A. Yes.

Q. What became of that report?

A. It was lost.

Q. When did you last see it?

A. Years ago.

Q. Do you know who made the report?

A. Yes.

Q. Who? A. Mr. Hal Klein.

Q. Anybody else connected with it?

A. Myself.

Q. And you haven't that report? A. No.

Q. And now, do these exhibits to which I have just referred, that is, the oil seal assembly and the outer case, both in Plaintiff's Exhibit 23, represent the only sample that you made at the time that you testified about?

A. Did you ask whether they were the only samples made?

(Testimony of Lloyd A. Johnson.)

Q. Yes, do they depict the only samples you made at that time?

A. We made quite a few samples at that time.

Q. But they were all just the same as this?

A. Yes.

Q. O. K.

A. Right at that immediate time?

Q. Yes. Now, did you make only one test?

A. No.

Q. A plurality of tests? A. Yes.

Q. How many?

A. I couldn't give you the exact figure, but I can give you an approximate figure.

Q. All right. A. Ten to fifteen tests.

Q. Does that mean ten to fifteen different seals?

A. Yes.

Q. What kind of a test did you make?

A. We have what we call test units or test heads in which the seals are mounted [251] therein and tested.

Q. They weren't put in any machine?

A. That is a machine in itself.

Q. Do you know how long they were run, or any one of them? A. Yes.

Q. How long?

A. Well, I think this one seal added up to seventy-two hours, as I recall it.

Q. Have you any written record whatever of those tests?

A. No, if we had, we would have brought it in here.

(Testimony of Lloyd A. Johnson.)

Q. Now, in connection with the file wrapper and your affidavit therein, you filed a print at some time after the affidavit was made. That sketch appears in this photostatic copy on page thirty-four. Is that the same as the one entitled "outer case" shown in Plaintiff's Exhibit 23?

A. Is it the same drawing; is that the question you are asking?

Q. Yes. A. No.

Q. That is a different one, is it?

A. No, you are asking me of this photostat—

Q. Yes. A. —is the same as outer case?

Q. Yes. A. EX317?

Q. That's right. A. The answer is no.

Q. Is it the same as any other drawing you have produced here today?

A. I will have to check it.

The Court: While the witness is looking at that, we will take the afternoon recess. [252]

(Recess.)

The Court: Proceed.

Q. (By Mr. Haight): On the pending question, is the representation of the seal found in the file wrapper the same as any of those you have produced here? A. Yes.

Q. Which one? A. EX314.

Q. That is the one of the oil seal assembly?

A. Yes.

Q. Now, in testing these seals you said you had a plurality. Were they all of the same size?

(Testimony of Lloyd A. Johnson.)

A. I didn't hear the first of that.

Q. In the testing of the seals, of which you said there was a plurality, when you tested them, were they all of the same size?

A. No.

Q. How many different sizes?

A. I think there were two.

Q. Were they all tested on the same machine?

A. No.

Q. Did the machines have a moving part adjacent to seals when you tested them?

A. I don't remember.

Q. Have you any records whatever in regards to tests of those seals except what you have produced here today?

A. No.

Q. I call your attention to Plaintiff's Exhibit 22. Do you know when that oil seal was made?

A. It was made about—If you will let me see the other one, I think I can remember.

Q. The other one is Plaintiff's Exhibit 21.

A. Well, about the same time.

Q. Is there anything connected with these that indicates the [253] date on which they were made?

A. Well, it would have to be made before the date it was tested, which would be 9/4/35, and incidentally, I notice this seal has been tested for a month. That is more than seventy-two hours.

Q. You have been calling attention to a material that appears upon the tag attached to Plaintiff's Exhibit 21, and that is the one to which you have already called attention to, which bears, among other things, the legend, "see test report No. 109 for details."

(Testimony of Lloyd A. Johnson.)

Now, the other one also has some material upon the sample for Mr. Owen. Have you any record as to the making of those, save these tags?

A. No.

Q. In whose handwriting do we find the entries appearing on these tags?

A. Mr. Klein's, on the tags that have been on them all the time.

Q. Yes. These were made in accordance with the drawings you have produced here, were they?

A. Substantially so.

Q. Will you take this one, the one that has been marked as Plaintiff's Exhibit 22. I will give you a straight edge. Now, tell me that if after the offset—no, I read from the claim of the Johnson patent in suit,

“a molded resilient sealing member bonded to both sides of said radial flange at said offset so that its outer radial face lies within the radial plane of the cup bottom [254] where it bends inward to form said offset, whereby said molded material is protected from wear by contact with adjacent moving parts.”

Where is the molded material in reference to the bottom of the cup in the sample that you have in your hand?

A. Well, the inside bottom or outside bottom?

Q. The outside bottom.

A. It is right here.

Q. Put a straight edge on it. What do you say?

(Testimony of Lloyd A. Johnson.)

A. What do you want me to say?

Q. I want you to say whether the language I have read applies to the structure you hold in your hand?

A. Substantially it does.

Q. By the word "substantially" you mean that it does not, don't you? That is like things being practically the same, indicating that they are different.

A. I mean this, that in this particular sample there is some rubber protruding, maybe here.

Q. That is not like Type A here accused, is it, where we have this inset?

A. You have the inset all right.

Q. The rubber comes clear out and somewhat beyond the bottom of the cup than the one you hold in your hand?

A. Yes.

Q. So it doesn't come within the claim of the patent in suit, does it, asking you as a patent expert?

A. No.

Q. I now call your attention to the other one that you have produced, Plaintiff's Exhibit 21, and that likewise is not [255] within the claim of the patent in suit, is it?

A. Let me see—no.

Q. When you first testified, you said you first saw the device of the Victor Manufacturing Gasket Company in 1939, and then afterwards, when you come to the stand, you said you had made a mistake and said that you first saw them in 1937; that's right, isn't it?

A. No.

Q. What is right?

(Testimony of Lloyd A. Johnson.)

A. I first learned of this seal from a catalog that I obtained in 1937.

Q. I see.

A. I first saw the seal in 1939.

Q. O. K. What catalog was that in which you first saw it in 1937, the catalog of the Victor Company?

A. It has been submitted in evidence here. I don't know the number of it.

Mr. Owen: It is the one with the green cover, Mr. Haight.

Mr. Haight: Plaintiff's Exhibit 13, that's right.

The Witness: I can tell in just a second here—yes, this is it.

Q. And on its outer cover is a picture of an oil seal made by the Victor Manufacturing and Gasket Company, is there not? A. Yes.

Q. That is like Type H, is it not?

A. I can't see this far away. I can see the board, but I can't see the catalog.

Q. Oh, I see, excuse me. A. Yes.

Q. About when in 1937 did you see this catalog, Plaintiff's Exhibit 13?

A. If you will give me a catalog I will [256] tell you. I saw it just a day or two prior to December 22, 1937, when I sent it to Mr. Owen in the mail.

Q. 1937? A. Yes.

Q. And the only claim you received in the Patent Office was filed in the Patent Office on November 18, 1938, a year later; do you know whether or not you had this structure and repre-

(Testimony of Lloyd A. Johnson.)

sentation of the structure before you when the only claim in this patent suit was presented in the Patent Office?

A. Do I know whether we had this Victor seal before us?

Q. Yes, or this representation of it.

A. We had seen it, yes.

Q. And what you endeavored to do was to see if you could draw a claim that could cover it, a thing that had been on the market for a long time, isn't that true? A. No.

Q. Wasn't that your endeavor in securing the only claim you got? A. No.

Q. Wasn't that what you meant when you said in Chicago you would use it for trading purposes?

A. No.

Q. Now, as I recall, you afterwards, in the Patent Office, as appears in the file wrapper, said that the drawing you filed was typical of those: Weren't any of those different from that of the drawing you were showed, or differed from those of the drawings you have produced here today?

A. I don't get your point.

Q. Maybe I do not make myself clear. You said that the drawing [257] you filed in the Patent Office was typical of seals you have made and tested. A. Yes.

Q. Now, I want to know if in that affidavit anywhere, there was reference to the drawings you haven't produced here today?

A. Now, I am not currently familiar with that affidavit.

(Testimony of Lloyd A. Johnson.)

Q. Well, let's get it again.

A. I can't *ask* your question without knowing it.

Q. I will find it for you. It was your second affidavit, I think. I am referring to this one here, Mr. Johnson. I will read it for you:

"Lloyd A. Johnson, being duly sworn, deposes and says that he is a resident of Hillsborough, County of San Mateo, State of California; that he is the applicant in the above entitled application; that he is the Lloyd A. Johnson who filed an affidavit under Rule 75 subscribed and sworn to by him September 18, 1937; that the attached photostatic copy of a National Motor Bearing Co., Inc., blueprint is typical of the sketches referred to in the earlier affidavit as having been prepared prior to December 14, 1935."

A. Yes.

Q. What I am getting at is this: Since you said that is typical, are there any of those different from those that you here produced today that you then had, or are these the only ones? Were there any more in addition to which you have [258] produced?

A. Were there any more?

Q. Yes, were there any more?

A. Yes, there were.

Q. What has become of them?

A. I don't know.

Q. There has been another blueprint produced here that has been marked as Plaintiff's Exhibit 20. When did you first see that blueprint?

(Testimony of Lloyd A. Johnson.)

A. I can answer that in this way: I saw it at about the time it was dated. I saw the original drawing made.

Q. About when? A. May——

Q. I think that is 5/23/35.

A. That's right.

Q. And the Mr. Klein whose name appears thereon is the same Mr. Klein you have referred to heretofore, is he not? A. Yes.

Q. What has become of the original drawing?

A. I don't know; Mr. Klein prepared that original drawing as I directed him to.

Q. Did I understand you to say during your examination today that the word "bonding" was used in your plant? A. Yes.

Q. You would secure your sealing elements by clamping them, do you not? A. Yes.

Q. And is that referred in your plant also as bonding them? A. As clamping.

Q. What? A. As clamping.

Q. But the word "bonding" is never used in respect to its style? A. No, it is not.

Mr. Haight: Will somebody help me with those blue prints [259] and I will refer to the Lee patent and Lord patent, and so on, and if someone will handle those, we can get along very rapidly.

Q. Will you turn to the Lee patent. Just put it right up there so Mr. Johnson can work with it. Are you familiar with the patent of which that is a drawing? A. Yes.

(Testimony of Lloyd A. Johnson.)

Q. In that there is bonding to both sides of the radial flange by the vulcanization process, is that true?

A. Is that what it says in the patent?

Q. I think you will so find.

A. Well, I will look at it—yes.

Q. And that is on page one, column one of the patent, where it says——

A. What line?

Q. Forty three:

“The inner member 11, including the head 10, is in spaced relation to the interior walls of the recess 5, and such space is filled with yieldable rubber 13 which is securely bonded to its contacting surfaces by vulcanization.”

That is right, isn't it?

A. Yes.

Q. Will you now look at the Lord patent? I call your attention to page two of the Lord patent, column one, line fifty six:

“In all of these joints it is preferable to secure the rubber to the joint members by bonding during vulcanization [260] so that the rubber of the joint member is put under the initial tension through the shrinkage of the rubber.”

That is what it says, isn't it?

A. Yes.

Q. So there is securing of the rubber by vulcanization; that is correct, isn't it?

A. Yes, in this patent.

Q. Look at the Miller patent, Figures 1, 2, and 3, page two, column one, line sixty three:

(Testimony of Lloyd A. Johnson.)

“In the construction disclosed in Figures 1, 2 and 3, the packing cup is held between the ends of the two piston plates or discs 6 and 7. According to the construction illustrated in Figure 5, a packing cup 26 is permanently molded onto the piston disc 7.”

How do you say that is fastened? Permanently molded means what to you?

A. That means that it is vulcanized on it.

Q. Now, in Penick——

A. I will agree that is molded.

Q. Now, this method of bonding by vulcanization is very old, is it? A. Yes.

Q. That was discovered by Goodyear in a Boston jail over a century ago, was it not?

A. I don't know.

Q. You don't claim you have made any invention or made any contribution to the art by using vulcanization process to attach these parts, do you?

A. No.

Q. That is old in many arts, isn't it?

A. Yes.

Q. Including the oil seal art?

A. I don't know how old [261] it is in the oil seal art.

Q. Ahead of your patent, is it?

A. I think Penick is ahead of our patent, and that is about as old as I know it.

Q. That is good enough. It is older than yours?

A. Yes, it is.

(Testimony of Lloyd A. Johnson.)

Q. Will you turn to the Frumveller patent? Here is a flange, is there not?

A. Would you turn it up the other way? That is better.

Q. Seen in this member down here in the dark cross-hatch member, and that is a flange, isn't it?

A. Is that this part you are talking about?

Q. That's right. A. Yes.

Q. That is radial, isn't it?

A. Which part of it?

Q. This part is radial.

Mr. Owen: Would you indicate by reference so the record will mean something?

Mr. Haight: All right, line forty three.

A. That is axial.

Q. That is east and west, isn't it? Is there any part of it radial?

A. Any part of that flange radial?

Q. Yes.

A. The matter between where it says "forty three" and the red color is radial.

Q. Suppose we rotated it to ninety degrees; what part is radial?

A. Well, you just reverse it. What was radial before is axial now. [262]

Q. It just depends on which way you turn it?

A. Yes.

Q. Now, how was this material, this sealing material, secured to that flange?

A. It is bonded.

Q. How?

(Testimony of Lloyd A. Johnson.)

A. It appears to be molded around that flange member.

Q. You as a man skilled in this art, if you had this before you and nothing else, would that kind of a sealing member on a sphere, do you think you would have to exercise any genius to put it on a shaft?

A. If I got the inspiration I would be lucky.

Q. And that is just the job of an ordinary mechanic with that before him, and putting it on a shaft, with that kind of a sealing member on a sphere, and putting it on a shaft with a parallel portion, or a straight section, is it not?

Mr. Owen: I object to this on the same ground Mr. Haight offered his objections.

The Court: Go ahead, I think it is proper cross-examination, even though he might be asking a question which does call for the witness' conclusion.

Mr. Haight: That is the way I have understood it for many years, your Honor.

The Court: I guess you'd better have that question read. I don't know whether the witness remembers it.

Q. (By Mr. Haight): Did you get the question? A. I am not sure of it. [263]

Q. All right, we won't pause then. Let's look at the Walker patent. Are you familiar with the Walker patent, No. 2,028,634?

A. Vaguely so.

Q. Who owns that?

(Testimony of Lloyd A. Johnson.)

A. A man by the name of Walker.

Q. Did your company ever purchase that patent?

A. I am not certain whether we bought it or took a license on it. Mr. Owen can answer that question.

Q. Isn't it true that was assigned to you March 12, 1936, and recorded March 15, 1937, and by you, I mean your company.

Mr. Owen: Mr. Haight, my recollection of that deal is we have an option to buy it. I don't think we exercised it, but we have the exclusive rights.

The Witness: I think that is it.

Mr. Haight: Well, that is as good as ownership.

Q. Are you in the fluid pump packing business—is your company? A. Fluid pump packing?

Q. Yes.

A. We make a type of seal for that, yes.

Q. In this Walker patent, the sealing element, which is, as I understand it from the patent, may be made of rubber or leather or fibrous material or the like, and is bonded to the inner surface of the threaded nut 31—are you familiar with that?

A. It has been so long, I would have to look at it.

Q. All right, we won't pause with it then.

A. There are over a thousand of these patents.

Q. You spoke—Oh, by the way, you said there were only about twenty of them in commercial use. Do you know what those twenty are?

A. I think I know most of them.

Q. Without spending much time, can you tell us?

(Testimony of Lloyd A. Johnson.)

A. I can name a few of them: The patent in suit; Chicago Rawhide has seven or eight; our company has a few; Universal Oil Seal Company has one or two; and Michigan Leather Packing Company have one or two.

Q. And so, out of a thousand patents that have gone to the Patent Office most of them have fallen by the wayside, is that right?

A. Those that are commercially successful are being used.

Q. But it is an extremely small percentage that you manufacturers consider any good; that's right, isn't it?

A. It is a small percentage that are commercially satisfactory.

Q. And the best one from the standpoint of your concern's business is the one that was discussed here the other day that you say is not covered by the patent in suit; that's right, isn't it?

A. The best patent?

Q. The one you use?

A. We use several; which one do you mean?

Q. Your commercial products.

A. Well, we are licensed under one of the Chicago Rawhide patents that more seals are made under than any other.

Q. What kind of a seal is that?

A. That is a seal in which [265] the sealing member is clamped in the case.

Q. And that is used more than any one?

(Testimony of Lloyd A. Johnson.)

A. Numerically, there are more seals made under that patent.

Q. And that is the way yours are?

A. Some of ours are.

Q. That is the way yours are fastened?

A. Some of them.

Q. Yes?

Mr. Owen: I might say for the purpose of the record that Mr. Haight was able to sustain that patent in the Seventh Circuit Court of Appeals.

Mr. Haight: I offer my apologies, your Honor.

Mr. Owen: He did a good job.

The Witness: Then, there is the Heinze patent which your company owns.

Q. (By Mr. Haight): My company?

A. Well, the Victor Manufacturing and Gasket Company; that is a dead ringer for this patent.

Q. Are there any others of these patents that are being used at all?

A. Of this type of seal a very few—about twenty of them.

Q. Of these, how many are living?

A. Quite a few—with seventeen years of life it goes back to 1929—about half of them, I guess. It is a guess, I don't know.

Q. Well, a guess is good enough on a matter of that sort. Now, in the Johnson patent itself, Figure 1, how is the sealing elements connected to the flange? A. Bonded. [266]

Q. That is, it is molded on, is that right?

A. It is molded on; bonded on.

(Testimony of Lloyd A. Johnson.)

Q. Now, in Figure 2, it is clamped, isn't it?

A. Clamped and molded—both.

Q. Yes, clamped and molded. Now, in the Johnson patent—have you the Johnson patent?

A. Yes.

Q. Will you look at page two, column one, lines thirty three to thirty six. It is describing what you are speaking of—Figure 2—at that point, isn't it?

A. Yes.

Q. Do you find this in the lines I have indicated?

A. Yes.

Q. “The composition will adhere to the side of washer 35 and also flow into holes 36 to strengthen the bond between the parts.”

Isn't adherence to the side spoken of as bond in that phrase?

A. Yes.

Q. In Figure 4, I call your attention to the Johnson patent, page two, column two, lines seven and nine, and in respect to the holes 50.

A. What is that again?

Q. Lines seven to nine.

A. Column two, page two?

Q. Column two, page two, that's right.

A. All right.

Q. “A series of holes 50 are located in this wall 31 of the outer cage and aid in securing a good bond.”

Isn't that right?

A. That is what it says.

Q. And in respect to Figure 5, if you will turn to the Johnson patent, page two, column two, lines twenty five to twenty nine, [267] describing that

(Testimony of Lloyd A. Johnson.)

structure, it says, beginning at line twenty three—
have you it? A. Yes.

Q. “In this type the composition material will flow on both sides of radial portion 53 into holes 54. It will adhere to the sides of radial portion 53 and the composition which has flowed through holes 54 further strengthens the bond between the composition material and metal.”

You are familiar with that, aren't you?

A. I am.

Q. Isn't it true that Figure 2 has a bonding under the very use of that word that we find in the Johnson patent by the clamping, between those two flanges and that bonding is aided by the flow of material through those holes?

A. Of the washer?

Q. Of the washer, that's right, isn't it?

A. Yes.

Q. And in Figure 4, we have, as I understand, the language of the Johnson patent, a bonding of the sealing element between this flange and the cup member of this flange or washer where there is an extrusion of the sealing element itself in holes in the cup? A. Yes.

Q. It is aided in the bonding by the two flanges, that's right, isn't it? A. That's right.

Q. In one of the drawings we had this afternoon, I have forgotten which one—I will find it—this is the outer case that we have in the Plaintiff's Exhibit? A. EX317.

Q. I notice in the figure at the top that eight

(Testimony of Lloyd A. Johnson.)

holes are [268] indicated, and as I read that, there is one-sixteenth of an inch, is that right?

A. That is right.

Q. That means that there are eight holes in the entire circumference? A. Yes.

Q. And each one of them a sixteenth of an inch in diameter? A. Yes.

Mr. Haight: I think that is all, your Honor.

Redirect Examination

By Mr. Owen:

Q. Mr. Johnson, reference was made to this figure and exhibit three, and the condition under which the pulley, which would be placed on either of these shafts to make this a usefully device would butt against the oil seal that would be at either end of the housing; under what conditions does that arise?

A. Well, to put the pulley on the shaft so that when the shaft revolves, the pulley revolves with the shaft. It has to be keyed or locked in place so that it will pull the belt that is on the pulley.

Q. Under what conditions would the contact be made at the end of the oil seal?

A. In the event that the pulley becomes loose on the shaft and rubs against the oil seal. In other words, the pulley could move back and forth on the shaft, some lateral movement.

Q. Reference was made to the patent to Lee.

A. Which patent?

(Testimony of Lloyd A. Johnson.)

Q. Lee, L-e-e. A. I have it.

Q. Patent No. 1,861,153. Is the bonding there any different, [269] particularly, than it is in Penick? A. No.

Q. Is that same thing true with regard to the Lord patent, No. 1,996,210? A. No.

Q. Does Lord show a bonding like Penick?

A. Yes.

Q. In Figure 1? A. Yes.

Q. Reference was made to Figures 1, 2 and 3 of the Miller patent where the sealing flange is clamped between the two cup members; is that a clamping action somewhat like the clamping action you get in Chandler, No. 1,905,800?

A. Somewhat.

Q. Is that bonding in the Walker patent a bonding like in Penick where it is a vulcanization type of adhesion? A. Yes.

Q. Mr. Haight was just reading from the patent in suit and I would like to go one sentence from where he started in on page two, at column one, and beginning at line twenty eight:

“In Figure 2 a modified form of construction is shown in which the rubber composition material is bonded to spacing washer 35. In manufacturing this type, the spacing washer 35, which may be of metal or composition material is positioned in the mold with the composition.”

Will you explain when that operation is done? Is that before or after it is put into the outer shell 33?

A. It is done before it is put into the outer shell. It is molded to it in the molding operation.

(Testimony of Lloyd A. Johnson.)

Q. Just like it would be in Figure 1 or Figure 5?

A. Yes. [270]

Q. Is that same thing true in Figure 4, and is the sealing member bonded to the shell, and is it then that it flows through the perforations?

A. No, it is bonded to the washer.

Q. Figure 4? A. Yes.

Q. Look at the patent, please.

A. It can be done either way.

Q. How is it done in Figure 4, and what does it say? Read the patent.

A. It is bonded, according to the patent, to the outer case.

Q. Is it then that it flows into the holes?

A. Yes, it is then that it flows into these holes as it is molded, it flows into these holes.

Q. What function does that which is marked 41 on the drawings have, that is placed on the inside?

A. It has the same function as it does in the other washer in Figure 2.

Q. What is that?

A. That is, it further clamps the sealing member.

Mr. Owen: That is all.

Recross Examination

Mr. Haight: Just two questions, your Honor.

Q. In view of what you have just said I call your attention to Johnson patent, page 2, column 1 and I read, beginning at line 4:

“It is preferable to sandblast radial wall 17 of cage 8 and apply a coat of cement which will insure a good bond between the composition and the metal.”

(Testimony of Lloyd A. Johnson.)

Now, the good bond is insured by the cement, isn't it? I am going to read the next, but so far that is what it means, doesn't it?

A. It says it is preferable to do that. That is the preferred way.

Q. But the cement will insure a good bond. You are talking about the meaning of bond; that's right, isn't it? A. Yes.

Q. "Next the composition is placed in the mold and the mold closed. Under pressure the composition material will flow into openings 13 of wall 17 and tie or bond the parts together."

Bond is used there in respect to flowing in the mold, and it is also used in respect to attaching by means of cement, isn't it?

A. It is a chemical and a mechanical bond, combined.

Q. But the word "bond" is used in the Johnson patent, itself, in referring to adhering by cement, isn't that right?

A. Not entirely. It doesn't rely only on the cement. [272]

Q. That is correct, it bonds with cement and it bonds with vulcanization. You either agree with me or you don't, and I don't care. But, do you agree?

A. I agree the cement aids the bonding.

Q. And cementing is bonding under the use of the word "bond" in the Johnson patent?

A. Yes, one of the uses.

(Testimony of Lloyd A. Johnson.)

Q. Let me ask you this question: What would you say to this? Do you think this a good definition of bonding, "That to bond two articles can signify no more than to unite them firmly by any means." Is that a good definition of "bonding"?

A. I don't think it is.

Mr. Haight: In which regard the witness does not agree with the Supreme Court of the United States. That is all, your Honor.

The Court: Mr. Johnson, I want to ask you a question:

Q. I understand this patent that is referred to as a combination patent, you are not claiming in the patent that any particular material used constitutes a novelty? A. No.

Q. Your claim is that it is the particular combination of elements that constitutes this device?

A. Exactly.

Q. That makes it novel? A. Exactly.

Q. That is your point? A. Yes, sir.

Q. Are there any other companies engaged in the making, or in the manufacture of this type of seal besides the Victor Manufacturing & Gasket Company, and your company, if it is engaged in that? A. Yes, sir. [273]

Q. Are there many?

A. I can name them for you; the largest one is the Chicago Rawhide Company, Chicago and Detroit; the Michigan Leather Products Company, of Detroit; Gratton & Knight, of Worcester, Massachusetts. There is another good sized one that slips my mind now.

(Testimony of Lloyd A. Johnson.)

Q. Has your company been manufacturing oil seals for use as such in quantity? A. Yes.

Q. How long?

A. Since 1930. We have gradually increased our quantity over that period of years.

Q. In the period, say, from 1935 to 1942 or 1943, or 1944, where in that period were you extensively engaged in that business?

A. I can give you a better picture of it by saying the largest producer of oil seals is Chicago Rawhide and National Motor Bearing Company, which is my company, the second largest in the United States, which will give you some idea of the relative standing of production.

The Court: I was particularly interested in that. I think that covers what I want.

Mr. Owen: If your Honor please, with regard to one of your questions, I was not sure whether it was clear to Mr. Johnson when you said, "Are there other companies besides Victor and National Motor Bearing Company, if National Motor Bearing is making seals," whether you were referring to a shaft-type of seal to fit a bore. There may have been some ambiguity there. [274]

The Court: I am talking about the type of seal for the purpose of keeping the oil seal in place.

Are counsel ready to submit the matter on briefs, then?

Mr. Haight: Yes, your Honor.

Mr. Owen: Yes, your Honor.

The Court: All right, the matter will be submitted, 30, 30 and 30. [274-a]

In the District Court of the United States for the
Northern District of California, Southern
Division

Civil Action No. 23697G

Suit for Infringement of
Letters Patent No. 2,146,677

NATIONAL MOTOR BEARING CO., INC., a
Corporation,

Plaintiff,

vs.

CHANSLOR & LYON CO., a Corporation,

Defendant.

The Depositions of

RENI J. GITS,

FRED A. REEVES,

JAMES ZAP, and

BEATRICE M. KREJCI,

taken on behalf of Defendant, at Chicago,
Illinois, on the 4th day of October, A.D.
1945, pursuant to Notice.

RENI J. GITS

Direct Examination

By Mr. Haight:

Q. State your full name, please.

A. Reni Joseph Gits.

Q. And where do you reside?

A. 341 Scottswood Road, Riverside, Illinois.

Q. What is your occupation?

A. Manufacturer.

Q. With what concern are you connected?

A. Gits Bros. Mfg. Co.

Q. How long have you been connected with that company?

A. Since 1911. That is thirty-four years.

Q. And what is your position in that company?

A. I am President, General Manager, and I am also [7*] a designer and inventor.

Q. How long have you been such?

A. Ever since the business has been organized.

Q. And we are now taking this deposition in the plant of that company, are we not?

A. That is right.

Q. Generally, what is the business of Gits Bros. Mfg. Co.?

A. Lubricating devices known as oil cups.

Q. Any other business?

A. No, that is it, exclusively. We are making oil seals, but that doesn't amount to a great deal.

Q. When did your company first become interested in oil seals?

*Page numbering appearing at top of page of original Reporter's Transcript.

(Deposition of Reni J. Gits.)

A. I would have to look that up.

Q. Approximately will do, for our purposes.

A. I think about 1924, or 1925.

Q. You need not look that up.

A. It is approximately that.

Q. I show you a patent, No. 2,052,762, issued September 1st, 1936, on an application filed December 14, 1935, entitled, "Oil Seal." It seems to be the patent of Reni J. Gits. Is that your patent, Mr. Gits?

A. That is right. That is mine. [8]

Q. Are you familiar with the structure illustrated in the drawings of that patent?

A. I am.

Mr. Haight: Mark this for identification as Defendant's Exhibit A.

(Said document was accordingly marked for identification Defendant's Exhibit A.)

Q. (By Mr. Haight): I am showing you a photostat of a drawing and some autographed material, which we are marking for identification Defendant's Exhibit B.

(The photostat of paper was accordingly marked for identification Defendant's Exhibit B.)

Mr. Haight: I will explain to counsel that this is a photostat, and we hope, when we examine Mr. Tarbox in Toledo, to produce the original, but for convenience I am using this now. We will ultimately offer the original, and will perhaps ask for leave to substitute photostats.

(Deposition of Reni J. Gits.)

Mr. Owen: That will be agreeable.

Q. (By Mr. Haight): Looking at this photostat, I will ask you if [9] you are familiar with it?

A. Yes, I am.

Q. Will you explain the structure that is represented there?

A. This is a molded part of synthetic rubber.

Q. And for what is it designed?

A. For an oil seal purpose.

Q. And what did you have to do with that?

A. I was trying to make an oil seal for Spicer.

Q. Spicer is what concern?

A. That is that Spicer Universal Joint, from Toledo.

Q. The Spicer Manufacturing Corporation of Toledo, Ohio?

A. That is right.

Q. And at the time that was made, was anybody else present?

A. Tarbox.

Q. Who is Mr. Tarbox?

A. He was the engineer for Spicer.

Q. There is another man named there. Who was he?

A. He represented Goodrich.

Q. And what is his name?

A. Haushalter.

Q. And by "Goodrich" you mean whom? [10]

A. The B. F. Goodrich Rubber Company.

Q. And what was the occasion of your being together?

A. He represented the synthetic rubber, and I represented the seal, and Tarbox was the buyer, or, in other words, the engineer, to see whether it would meet the purpose.

(Deposition of Reni J. Gits.)

Q. And what was the date of the meeting?

A. It was in 1933. It was about the middle of the year.

Q. Can you tell us accurately, by referring to the date on that photostat?

A. It has "6/30/33." I remember it was in the summer, that was the middle of the year of 1933. That I can remember. I can remember that distinctly.

Q. Do you know whose handwriting appears upon this exhibit?

A. This looks like Mr. Tarbox's.

Q. By "this" you are referring to what?

A. I am referring to the words "Tarbox, Gits & Haushalter. Prints obtained by Gits & Haushalter." This right on here.

Q. By "this" you are referring to something in writing on Defendant's Exhibit B?

A. Yes. "Drawn by Messrs. Tarbox, Gits & Haushalter [11] 6/30/33. Prints obtained by Gits & Haushalter."

Mr. Owen: Do you have a copy of that photostat, Mr. Haight?

Mr. Haight: Yes.

Q. (By Mr. Haight): I notice on this drawing certain dimensions. Those are dimensions of what?

A. Those are dimensions of the synthetic part.

Q. You say "synthetic." Synthetic what?

A. Synthetic rubber.

Q. Designed for a seal, you said a moment ago?

A. Yes.

(Deposition of Reni J. Gits.)

Q. Whose seal?

A. This is my seal, designed for the Spicer shock absorber.

Q. How does the structure of that seal compare, if it does compare, with any of the drawings shown on the Gits Patent, to which I have made reference?

A. I don't know just what you mean. The size is the same.

Q. Yes?

A. And the holding is practically the same, with an expanded ring inside, to bind it against the walls, the same as this.

Q. The same as the structure shown in your patent?

A. Yes, that is right. The only difference is that this one here was to be put into a solid shell.

Q. You say "this one here." You mean into the synthetic rubber structure?

A. That is right.

Q. Shown on this drawing, Defendant's Exhibit B. That was designed to be put in what?

A. To be put in a screw machine housing. I mean by screw machine housing a part that is made on a screw machine. I guess you know what I am talking about.

Q. Yes.

A. Whereas, this one here was designed to put in a stamping.

Q. By this last "this one here" you are referring to the structure shown in your patent?

A. Yes, when I say "stamping."

Q. Save for that, what differences if any were

(Deposition of Reni J. Gits.)

there between the structure shown in the patent and the structure for which this particular synthetic rubber member was designed?

A. The difference is, on the screw machine. The flange was on the bottom to prevent the synthetic part going through, whereas, in my screw machine part, I put the flange on top. You can follow me on that? [13]

Q. Yes.

A. I put the flange on top—I couldn't say on top, but on the top of the part that goes into the housing, where it contacts the housing. You understand that, do you?

Q. Yes, I think so. We may come back to that a little later.

When did you first conceive or think of this oil seal that is shown in your patent No. 2,052,762, the one that is before you?

A. I will tell you how this goes about. I might have made a sample of this, because I make all samples even before I make a drawing. I might have made a sample of this about three or four or five or six months before.

Q. About when did you, as you recall it?

A. The boys may be able to give you some information on that. I couldn't say.

Q. When was it in reference to the time that you had this meeting of Tarbox, Gits and Haushalter?

A. Prior to this, you mean?

Q. Yes. Was it prior?

(Deposition of Reni J. Gits.)

A. That might have been. I don't know. I want to get it right.

Q. Of course. [14]

A. At the same time, I don't want to get away off on it. This morning I thought of something which perhaps won't go on paper, or perhaps won't be made for another six, seven or eight months, maybe a year. The same thing could have happened to this. That is a hard thing to state, if that is what you are trying to get, I don't know.

Q. You said that you made your article, you made the thing before drawings were made of it?

A. That is right.

Q. Has that been your regular practice?

A. That is right.

Q. Throughout all this period that you have been operating this company? A. Yes.

Q. I think I will put it this way: Did you have the idea, did you get the conception of the structure shown in the patent that I have just referred to before the time of this meeting with Tarbox and Haushalter, which, according to Defendant's Exhibit B, was on the 30th of June, 1933?

A. What was that sales record? Wait until I get those sales records. I have to get something to enlighten me.

(A short interruption.) [15]

By the Witness:

A. (Continuing): The only thing I could say, possibly maybe two or three weeks or a month be-

(Deposition of Reni J. Gits.)

fore this date, on this 85. (Witness indicating on a card.)

Q. (By Mr. Haight): Which line are you pointing to? A. "4-12-34."

Q. About six months before that, you conceived of the particular structure shown in the drawings of the patent, is that right?

A. Yes. It was away ahead of this filing date. It was in that time there (indicating).

Q. You have just referred to a card. What is this card?

A. That is a price card, a customer's card, where we record all our orders, our quotations, and things of that kind.

Q. On that card, you referred to a particular line. Which line was that?

A. This one here (indicating).

Q. And this one here is down near the bottom of the card, and it is 4-16-34? A. Yes.

Q. That means April 16, 1934? [16]

A. That is right.

Q. Now, there are some entries there.

A. Yes. We quoted on that seal 25,000, 50,000, 75,000 and 100,000.

Q. You made those quotations on that seal. What seal do you mean?

A. That is 85, isn't it?

Q. Yes. What did the seal look like? Was that the seal of this patent?

A. Yes, that is the seal of the patent, all right. That is it.

Q. What does No. 85 seal refer to?

(Deposition of Reni J. Gits.)

A. That is this oil seal here.

Q. That is what you called that seal at that time?

A. Whether it was the one with the screw machine part or the other one, I don't know.

Q. I do not care how it is made. It is a question whether it was that seal or not.

A. Oh, yes, it was that particular oil seal. That is the one I have reference to.

Q. And that is what you called your 85?

A. That is right.

Q. I notice some other red entries in connection with that same thing. What do those mean?

A. Those are quotations. The reds are quotations, [17] and the blacks are orders.

Q. That is, on this card, when you see anything in red, as this entry is, that means you made a quotation, you offered to sell?

A. That is right.

Q. That does not mean that you got the order for it? A. That is right.

Q. The black ones mean that you got the order?

A. That is right.

Q. To the right of this 85 seal, I find some other entries. What do those mean?

A. \$78 per thousand in lots of 25,000.

Q. And lots of 50,000? A. \$77.

Q. And over here, lots of 75,000 and 100,000, \$76.25 a thousand? A. That is right.

Q. Below that I see some other entries. What do those mean?

(Deposition of Reni J. Gits.)

A. That was a felt washer that went with that. That was an additional item, it was additional to that. That is a price on the felt washer.

Q. About how long before this date do you say it was that you conceived of this structure that is [18] shown in your patent 2,052,762?

A. Which do you mean, this one structure in this steel housing, or in the screw machine housing?

Q. Let us take the screw machine housing first.

A. The screw machine housing goes away back.

Q. About how far?

A. That will go beyond April 16, 1934. That will go back at least three months, two months; because I have to make the sample, and I have to make those parts first, and then submit a price. If you will turn over this way (indicating), this is something else.

Q. Just a minute. Let me clear this up. When they are not screw machine made, how are they made?

A. They are made out of punchings.

Q. And the one illustrated in the patent is one made by punching, is that right?

A. That is right.

Q. Going back to this drawing, Defendant's Exhibit B, dated June 30, 1933, this sealing element illustrated in the drawing was designed to contact with what?

A. With the screw machine part.

Q. And the ends of this sealing element, this synthetic rubber element, what do they contact [19] with?

A. They contact the shaft.

(Deposition of Reni J. Gits.)

Q. Let us now see that other drawing, which, for identification, we will mark Defendant's Exhibit C.

(Said drawing was accordingly marked for identification Defendant's Exhibit C.)

Q. (By Mr. Haight, continuing): I show you another drawing.

A. Wait a minute. That goes back to 1933.

Q. Just a minute. What goes back to 1933?

A. That thing there. See that date on there?

Q. Yes, sure. That is what I wanted to get straightened out.

A. I am wrong. I went back to 1933 on this thing.

Q. As early as the date that appears on the drawing, Defendant's Exhibit B, June 30, 1933?

A. That is right. That is the date to go by.

Q. Now, having that straight, I am going to show you this other drawing, Defendant's Exhibit C. It has at its bottom, "Gits Bros. Mfg. Co. Chicago 7-20-33." And what are those initials down at the bottom?

A. That is Reeves. That looks like "F.A.R." That is Reeves. He will identify that.

Q. Who is Mr. Reeves? [20]

A. He is the engineer.

Q. And what was his connection, if any, with the Gits Bros. Mfg. Co. back during 1933?

A. He was here as a draftsman.

Q. Has this drawing been in your possession

(Deposition of Reni J. Gits.)

ever since? That is, in the possession of your company? A. It must have been, yes.

Q. Will you notice the structure represented upon that drawing, and, just for our convenience and understanding, I will ask you how it compares with the structure shown on the drawing Defendant's Exhibit B, that is the one of June 30, 1933.

A. It is practically the same, only they have got more detail there, $7/16$, $9/16$, $3/4$, $5/8$. It is practically the same. This is $1/8$. That is $15/1000$ wider.

Q. Without checking over all those dimensions, save for possible differences in dimensions, do they both show the same structure?

A. Yes, they do the same work.

Q. What do you call this element in black in this drawing Defendant's Exhibit C?

A. That is the synthetic part of the sealing member.

Q. And what was that designed to go into? [21]

A. Into a shock absorber.

Q. And what held the sealing member, what was that associated with, if anything?

A. That was held by a housing.

Q. Have you an example of the housing with which that was used?

A. Here is one. (Producing same). I should have another one. Do you want the other one, too?

Q. Any sample of that.

A. There is one. That is on your drawing here, that is on this.

(Deposition of Reni J. Gits.)

Mr. Owen: The witness pointed to the patent drawing.

Mr. Haight: That is right.

You have just handed me what appear to be two seals. One has been mutilated by a cut through the same. I am going to have the mutilated one marked for identification Defendant's Exhibit D.

(The seal referred to was accordingly marked for identification Defendant's Exhibit D.)

Q. (By Mr. Haight): I am going to ask you generally, as an opinion, is this structure, Defendant's Exhibit D, [22] made in accordance with the structure illustrated in your Patent 2,052,762?

A. That is right. It is identical.

Q. And will you describe that, it is mutilated, so that we can see the parts?

A. There is an expanded ring inside of the synthetic sealing member. The ring is expanded, and this is for the purpose of adhering the synthetic rubber against the walls of—what do they call that?—the outer member.

Q. That is all right.

A. The outer member.

Q. Will you look at the drawing, Fig. 1 of the Gits patent 2,052,762. I notice that in the article, Defendant's Exhibit D for identification, that is this member right here, you referred to an expanded ring. Where is that shown in Fig. 1?

A. That would be the Figure 12 here, wouldn't it, that signifies this ring?

(Deposition of Reni J. Gits.)

Q. Let me see if I get this:

“A clamping member comprising an annular ductile ring 11 is utilized to secure the packing member to the flange of the shell or housing 1.”

A. Yes. What is 12, then? [23]

Q.

“The ring 11 is formed to be received and seated in the counterbore 9 formed by offsetting the clamping portion 6 of the packing member and is provided with a centrally located annular grove 12 in its outer periphery.”

A. Oh yes, that is right.

Q. So the ring is 11? A. Yes.

Q. And where is the packing member?

A. That is the synthetic member.

Q. Illustrated in Fig. 1 of the patent drawing, isn't it? A. This member here.

Q. What do you call that member?

A. That is the sealing member. That is the synthetic part.

Q. That is the synthetic part? A. Yes.

Q. In the drawing, Fig. 1, is your clamping ring shown in its final position?

A. That is right.

Q. How is it shown over here in Fig. 5?

A. It is ready for expansion.

Q. After it is expanded, then it assumes the [24] position that you have shown in Fig. 1, is that right?

A. That is right.

Q. And this member, the synthetic member, is clamped as shown in Fig. 1, is that right?

(Deposition of Reni J. Gits.)

A. That is right.

Q. Is that true of the structure shown in Defendant's Exhibit D for identification?

A. That is right. It is identical.

Mr. Haight: Will you mark this oil seal Defendant's Exhibit E for identification?

(The oil seal referred to was marked for identification Defendant's Exhibit E.)

Q. By Mr. Haight: I show you another oil seal, marked Defendant's Exhibit E for identification. This is not mutilated. In order to save time, I am just going to ask you this leading question:

Is that the same as the one shown in Defendant's Exhibit D? A. The same thing.

Q. And illustrated in Fig. 1 of the Gits patent?

A. That is right, the same thing.

Q. Referring to these two oil seals, Defendant's Exhibits D and E for identification, where have they been?

A. You mean, where they have been?

Q. Yes. A. These particular oil seals?

Q. These particular oil seals.

A. They have been amongst my other samples.

Q. In this plant?

A. That is right. They have been in this plant, yes, sir.

Q. How long have they been here?

A. Since 1933.

Q. We referred a little while ago to a card from your order record. Where is that card?

A. Here it is. Here is No. 2.

(Deposition of Reni J. Gits.)

Mr. Haight: You referred, Mr. Gits, to a card showing orders received by this company, and quotations made, and you called attention to a particular entry that you have read into the record. We are going to leave the card here, but the reporter will mark it for identification Defendant's Exhibit F, so that later it can be looked at if we wish, and it is agreed by counsel that we may arrange to get a photostat of that, and put the photostat in evidence [26] as Defendant's Exhibit F, but this will be here to check up, if any question arises.

Is that all right with everybody?

Mr. Owen: Yes.

Q. (By Mr. Haight): These exhibits that you have shown, Defendant's Exhibits E and D for identification, have in them a synthetic rubber member, is that right? A. That is right.

Q. Did you before that time, or at any time, make that same seal, but with another member instead of the synthetic rubber? A. I did.

Q. What did you use in those?

A. Leather.

Q. And how did you conform that leather to the proper shape for those oil seals?

A. In a die, in a mould.

Q. You moulded that leather in a die?

A. Correct. You cannot mould leather, but you can form it.

Q. Yes. Now, that device was exactly the same, except that it had the leather instead of the synthetic rubber? A. That is right. [27]

(Deposition of Reni J. Gits.)

Q. Did you ever sell those?

A. The leather?

Q. Yes. A. Yes, we sold the leather.

Q. Before the time that you offered these for sale, as shown by your order record?

A. That is right.

Q. About how long before?

A. We sold them. I will have to look on here. Here we have got an order October 28, 1933, we have got an order for 74,000.

Q. And your order record shows that?

A. Yes.

Q. That was an order for how many?

A. 74,000.

Q. Was that order filled?

A. Yes, that order was filled.

Q. And to whom were those sold?

A. Spicer Manufacturing Corporation.

Q. That is the same Spicer Manufacturing Corporation that we talked about a while ago, is it?

A. That is right.

Mr. Haight: Unless you wish it, Mr. Owen, instead of putting that actual record in, I will just let it go in his statement, or we [28] will do the same as before. Would you like to have the photostat?

Mr. Owen: That is the back side of the card which has already been produced?

Mr. Haight: Yes.

Mr. Owen: Let us have it photostated.

Mr. Haight: Then may it be understood between

(Deposition of Reni J. Gits.)

counsel and the witness that we will also make a photostat of the back side, in order to show the sale to which the witness has just referred, and we will put it in evidence as Defendant's Exhibit F.

The Witness: Could you get any of this information from Spicer?

Mr. Haight: Yes, I could, but I think this will be enough.

The Witness: Because we only started keeping this record about this time, some of these orders may not be on here. If you want to get more of an accurate record of orders that we received from them, and orders we filled, I think that you ought to get it from Spicer.

Mr. Haight: I think, for our purposes, just showing one order is enough. [29]

Q. (By Mr. Haight): There were other orders of that same structure that you filled in addition to these 74,000?

A. There were other smaller orders, yes, 100, 200.

Mr. Haight: That is sufficient. Now, going back to the back side of this card, we will also photostat that, and it will be part of Exhibit F.

Will you mark this for identification Defendant's Exhibit G?

(Three members marked for identification Defendant's Exhibit G.)

Mr. Owen: Is Exhibit G the other side of the same card?

Mr. Haight: No. Both side of that card are F.

Q. (By Mr. Haight): I am now showing you

(Deposition of Reni J. Gits.)

three cup-like members, to which there is an identifying tag attached marked Defendant's Exhibit G for identification.

What are those?

A. Those are housings. These are the plain housings.

Q. Are those the same housings that we find in Defendant's Exhibits E and D?

A. Yes, the same thing.

Q. I notice, if you will call these cups, that the bottom of the cup is indented around its inner margin. Is that the way you made all those during that time? A. That is right.

Q. And that is the same construction in respect to the cup that we find in these other two Exhibits, D and E, is that right? A. That is right.

Q. And were the cups the same as those that used the leather instead of the synthetic rubber?

A. Well, they were the same shape. They were the same shape.

Mr. Haight: Will you mark this Defendant's Exhibit H for identification?

(A print of a drawing was marked for identification Defendant's Exhibit H.)

Q. (By Mr. Haight): I am showing you a print of a drawing marked for identification Defendant's Exhibit H. It bears the date 4-16-34, drawing No. G.S. 998, Gits Bros. Mfg. Co. "Proposed methods of tensioning 85 oil [31] seal."

That is the same 85 oil seal we have been talking about heretofore? A. That is right.

(Deposition of Reni J. Gits.)

Q. Do you recognize that drawing?

A. I do.

Q. What does it disclose, as you understand it?

A. It discloses an oil seal.

Q. What oil seal?

A. That oil seal that we made for Spicer.

Q. How does that structure compare with the structure shown in your Gits patent 2,052,762?

A. The only difference is it has another shell holding the spring down.

Q. Where was that drawing made?

A. At our plant here, by Mr. Reeves.

Q. Made by the same Mr. Reeves?

A. Yes.

Q. And at about the date that it bears, 4-16-34?

A. That is right.

Q. How does that compare with Fig. 6 of the Gits patent drawing?

A. It is identical to that.

Q. I show you a blue print that is also dated 4-16-34, and bears the same legends that I have [32] heretofore read, and some other autographed ones that I am coming to, and also bears some pencil marks.

Mr. Haight: I will ask that be marked Defendant's Exhibit I.

(The said blue print was accordingly marked for identification Defendant's Exhibit I.)

Q. (By Mr. Haight, continuing): Are you familiar with this blue print that we have just marked for identification Defendant's Exhibit I?

(Deposition of Reni J. Gits.)

A. Yes, because I delivered that personally to the patent attorney.

Q. And who was the patent attorney to whom you delivered it?

A. Rummler & Rummler.

Q. Which Rummler did you deliver it to?

A. Eugene Rummler.

Q. Do you know where it has been since the time you delivered it to him?

A. Oh, no doubt it has been in Rummler's file.

Q. But you recognize it as one you delivered to him? A. Sure. [33]

Q. When did you make that delivery, in respect to the time that this patent application was made that eventuated in patent 2,052,762?

A. You are asking a whole lot.

Q. Was it some time before?

A. This thing here?

Q. Yes.

A. It was right after it was made. It might have been taken a few days afterwards, or it might have been taken the same day.

Q. When this drawing shown in Defendant's Exhibit I for identification was made, did Mr. Reeves have the actual structure before him?

A. Yes.

Q. And that was in accordance with your regular practice? A. That is right.

Q. I notice upon this some pencil marks. Can you explain those?

A. When we got it to the patent attorney, it was

(Deposition of Reni J. Gits.)

necessary to make more than one drawing of this, so we split the thing up, and made two drawings of it. You have it here. That is this one here (indicating). There is one of these that holds the spring down, while the other one is held by this little [34] projection coming out.

Q. Let us get this straight. You have called attention to the fact that there are different figures in the patent drawings. We can see those. But upon this particular blue print there are pencil marks.

What change, if any, do those make in the structure shown in the drawing itself?

Let me call your attention to a particular one.

Down near the bottom of the drawing, near the center, here is a cartouche or circle drawn, calling attention to the structure within that circle.

What is represented by the pencil marks at the point to the right within the circle?

A. That is a recess there.

Q. A recess in what?

A. In the ring, in the expanded ring, in the clamping ring.

Q. That recess is shown in the drawing of the patent, is it not? A. Yes.

Q. What is the purpose of that recess?

A. For the rubber to circle around into it, so as to clinch it.

Q. A part of the rubber is to the right of the recess, is that right?

A. That is right, so it will spread over.

Q. Another part is to the left of the recess?

A. That is right.

(Deposition of Reni J. Gits.)

Q. And some of it is pushed within the recess?

A. That is right.

Q. I notice upon this same blue print, Defendant's Exhibit I for identification, the word "Witness" and under it two names.

The first one is Frank Zeman, is that right?

A. That is right.

Q. Who was Frank Zeman?

A. He was my Office Manager at that time.

Q. Is he in your company's employ now?

A. No, he is a competitor.

Q. Also the signature of M. A. Russell. Who was M. A. Russell?

A. She was an office girl.

Q. What was her first name?

A. I do not know.

Q. Is she still in your employ? A. No.

Q. I notice here the name, "R. J. Gits, Inventor." [36] Does that identify you?

A. That is right.

Q. Whose handwriting is that in?

A. That is mine.

Q. And did Frank Zeman sign his name there?

A. That is right.

Q. And did Miss Russell sign her name there?

A. That is right.

Q. I notice the jurat of a notary public over here, Beatrice M.—how do you spell that?

A. K-r-e-j-c-i.

Q. Who is she?

A. She is my private secretary.

(Deposition of Reni J. Gits.)

Q. Is she still in your employ?

A. That is right.

Q. When were those signatures placed upon that piece of paper, that blue print?

A. At the same time the notary's seal was put on.

Q. And that date is April 16, 1934, is that right?

A. That is right.

Q. Did you have any experience in trying out these synthetic rubbers in these seals? Did you try out different compositions? [37]

A. That is right.

Q. What different compositions did you try out?

A. Koroseal.

Q. And what else?

A. Duprene. And I think that there is another one.

Q. I am going to call your attention to some photostats of letters, but before doing so, what has been your custom in respect to correspondence received and copies of correspondence sent out by your company, in regard to keeping it?

A. We generally keep it for five years. Not generally, but we keep it for five years and then we destroy it.

Q. And then you destroy those things that are more than five years old, from time to time?

A. That is right.

Q. I am going to show you a series of photostats of what purport to be letters, and I, for the moment, will identify them by their dates, and sub-

(Deposition of Reni J. Gits.)

sequently we will staple them all together and give them one exhibit number.

The first one is a photostat of a letter dated July 15, 1933, addressed to your company, and [38] to your attention, R. J. Gits, and sent by The B. F. Goodrich Rubber Company. It calls attention to eight samples of Koroseal and eight samples of Duprene Compound, and it says these are being sent to you.

Were you at that time using those two different sorts of things, trying them out in these oil seals?

A. I think a little time previous to that I got the sample, and I made it myself, and it was just exactly what they liked.

Q. Even though you might have been doing it before that time, at that time you were working with those two?

A. I think I got a square piece of that stuff, I think about three inches long and about two inches wide.

Q. Yes.

A. Oh yes. Now I get it. I got that piece from Goodrich, from Haushalter there, a little piece about four inches long and two inches wide, and about half an inch thick, and from that I made my first synthetic inserts, and those were presented to Tarbox. Just when I got that, I don't know. It was all during that time. And it was O.K.'d by Tarbox, so we were to get busy, and start making the things, and I wanted a [39] slab of that rubber ready to mould, and he told me I couldn't make it, they would make it themselves. That left me out.

(Deposition of Reni J. Gits.)

I said, "All right. I will furnish the rings, you make the moulded parts and I will insert them in the steel housings."

Q. What was done after that?

A. It was a sad story as far as I am concerned. Then Chicago Rawhide butted in on us, and bought up all the synthetic rubber that Goodrich could make that year, so it left me out in the cold. I did all the experimenting, all the work, all the designing, and all the patenting.

Q. Did you try out these seals in your own plant?

A. Oh yes, they were tried out on our little testing fixture.

Q. How did they work?

A. They worked all right, only they got dry, and scored, and started to leak. They had too much spring tension on them.

Q. What did you do about it?

A. I just left it go, I didn't think very much of it, but it did the work for Tarbox, because it was a vertical slide, up and down, and it always had a [40] chance to get some lubrication, whereas, in the rotating, they were satisfied with the tension of the rubber, because they had no head of oil to hold, the oil was down to the bottom, they had a clean shaft.

Q. Does this structure of your patent, that oil seal, work either with a rotating shaft or with a reciprocating shaft?

A. Oh yes. It wouldn't make any difference.

(Deposition of Reni J. Gits.)

Q. I am going to show you another letter, dated August 11, 1933, addressed to Mr. R. J. Gits, Gits Brothers Manufacturing Company, sent by The B. F. Goodrich Rubber Company, the first paragraph of which states, in part:

“In the attached mailing bag we are forwarding to you a quantity of oil seal rings made in accordance with Figure 2 on your sketch dated 7-20-33.”

A. That was our sketch.

Q. I find that Defendant's Exhibit C is dated 7-20-33. Is that the sketch?

A. That is the sketch.

Q. Then he says something about NRA, and so on, that is of no importance here.

The next letter is dated August 24, 1933, [41] addressed to you, and your company, by The B. F. Goodrich Rubber Company, with copy, apparently to Mr. Tarbox. This also has something to do with those rings. I won't stop to go into it at all.

A. Yes. That is those expanding rings we are talking about.

Q. The expanding rings used in your oil seal?

A. Yes. They had some trouble. We had to trim them.

Q. The next letter is dated August 30, 1933, addressed to R. J. Gits, President, Gits Bros. Mfg. Co., from The B. F. Goodrich Rubber Company, by J. E. Thomas, with copy to Mr. G. L. Tarbox—Spicer Mfg. Co. They refer there to making an equal number of Duprene and Koroseal oil seals.

(Deposition of Reni J. Gits.)

They also say that they regret that they had approximately 43 Duprene seals ready for shipment, and then there is some discussion about the trimming of them.

To my mind, the point about this is this mention as of that time of the Duprene and Koroseal oil seals.

The next one is dated August 31, 1933, a letter to you as President of your Company, also from The B. F. Goodrich Rubber Company, with copy to [42] Mr. Tarbox, in which they refer to forwarding to you Koroseal oil seals, and seven samples of Duprene seals.

Do you remember receiving seals from them at that time? A. That is right.

Q. And you used them here?

A. That is right.

Q. The next one is dated September 1, 1933, addressed as the previous one, and signed as before, with copy to Mr. Tarbox.

They speak here of forwarding thirty-nine Duprene oil seals and six Koroseal oil seals.

Do you remember receiving those about that time? A. Yes.

Q. And the next one is copy of a letter of September 5, 1933, addressed as before, signed as before, copy as before, and again refers to the sending of Koroseal oil seals "for which we have metal rings."

Were those transactions going on during that period? A. That is right.

(Deposition of Reni J. Gits.)

Q. And the next one is September 25, 1933, [43] addressed and signed as before, this one apparently sent by Mr. Haushalter, with copy to Mr. Tarbox.

It speaks of some tests, and speaks again of the Koroseal and Duprene seals, then something about trimming them.

The next one is dated September 25, 1933, from Goodrich to Tarbox, and it says that he has written to you as per copy attached, and the one I have just referred to of September 25, 1933, is apparently the copy attached, and the one I am now referring to of the same date, attention to Mr. G. L. Tarbox, refers to the letter written to Mr. Gits requesting 100 more of the brass insert rings for the seals for the hydraulic shock absorbers, and speaks of their going ahead with 50 each of the seals of Koroseal and Duprene, as soon as the rings are received.

The next one is a copy of a letter dated March 27, 1934, to Gits Bros. Mfg. Co., from Spicer Manufacturing Corporation, by Mr. Tarbox.

It says:

“We have given your Number 85 Seals, both hardnesses, thoro tests, and find the harder material works OK.”

Did you at that time have some harder and some softer [44] material? A. That is right.

Q. Can you give us briefly what the differences were between them?

A. The harder material held the shaft a little more firm.

Q. It refers to the Number 85 Seals. Those

(Deposition of Reni J. Gits.)

were the ones that you said before you made in accordance with your patent? A. Yes.

Q. The next letter we have is from Gits Bros. Mfg. Co., signed by R. J. Gits, to the Spicer Manufacturing Corp., saying that the Number 85 seals are working out satisfactorily.

(Reading):

“Mr. Zeman, who called on you yesterday at Toledo, advises that you wish these seals redesigned and made according to our OS-438, except 5/16” wide.”

What does that refer to?

A. What date is that?

Q. March 29, 1934.

A. It is another job, I think. No, it refers to 85. Our OS-438, that is our standard oil seal.

Q. Yes. [45]

A. And they wanted them the same width, because they used our standard oil seal first in the housing.

Q. What was the standard oil seal?

A. The standard oil seal was that 438, that was the width. That was the standard oil seal. Now, the standard oil seal is the same, except it is 5/16” wide. The standard oil seal must have been a little wider.

Q. That refers to dimensions, then?

A. That refers to dimensions.

Q. The next one is one of July 19, 1935, to

(Deposition of Reni J. Gits.)

Tarbox from Gits Bros. Mfg. Co., by R. J. Gits, which says:

“—we are enclosing two samples in the attached mailing bag, the seal material made from Koro-seal.

“We are getting samples of Thiokol from the Manhattan Rubber Company and as soon as they are received we will forward additional seals made from this material.”

Do you remember using Thiokol?

A. Yes, it wasn't any good.

Q. And the ones that worked were the other two? A. Yes. [46]

Q. The next one is a copy of a letter to Gits Bros. Mfg. Co., dated July 22, 1935, from Spicer Manufacturing Corporation, G. L. Tarbox, saying that they had received the seals mentioned in your letter of July 19, and put two of them on test.

(Reading):

“These are showing up very nicely. Can we obtain twelve of these so that we can put some of them on road test immediately?”

The next one is dated July 25, 1935, to Spicer Manufacturing Corp., from Gits Bros. Mfg. Co., saying:

“As requested in your letter of July 22nd, we are sending you under separate cover twelve oil seals made from Koroseal.

“The Thiokol seals are going forward to you in the next ten days.”

(Deposition of Reni J. Gits.)

The next one is dated August 23, 1935, from Gits Bros. Mfg. Co. to Tarbox, referring to Thiokol seals.

The next one is dated September 5, 1935, to Gits Bros. Mfg. Co., from Spicer Mfg. Corp., by G. L. Tarbox, saying:

“We have tested the latest seals you sent to us. [47]

We found the ones made with Koroseal to be pretty good. The Thiokol seals did not work.”

I think you will recall that, from something you said a little while ago. A. Yes.

Q. The next one is dated September 20, 1935, to Spicer Manufacturing Corp., from Gits Bros. Mfg. Co., saying:

“—the last sample seals made with Koroseal are working out satisfactorily.”

I have here a drawing with entries on it that supposedly are made by Mr. Tarbox. We will get to that tomorrow. “Put 4 on test 7/29/35,” signed, “G. L. Tarbox.” At the top of that is a drawing, and one of the members is referred to as “Koroseal,” with a lead line.

Are you familiar with that? Do you know whose drawing that is?

Mr. Owen: Have you ever seen it before, Mr. Gits?

A. (By the Witness): I don't remember. A thing like that I wouldn't remember.

Mr. Owen: Shall we mark that for identification? [48]

(Deposition of Reni J. Gits.)

Mr. Haight: Yes. It refers to these letters.

Mr. Geppert: "J" will be the letters.

Mr. Haight: This group of letters I have referred to, and will prove up further later, is stapled together, and we will mark it for identification Defendant's Exhibit J.

(The photostats referred to were stapled together and accordingly marked for identification Defendant's Exhibit J.)

Mr. Haight: Will the reporter now mark the drawing referred to, that has not yet been identified by the witness, but for future purposes, as Defendant's Exhibit K for identification.

(The photostat referred to was accordingly marked for identification Defendant's Exhibit K.)

Mr. Haight: You may cross-examine, Mr. Owen.

Cross-Examination

By Mr. Owen:

Q. Referring to your patent 2,052,762, which is Defendant's Exhibit A for identification, the sealing member shown there, and identified by the numeral 5, is not bonded on that sealing flange 5, is it? A. No.

Q. It is made separately and then put in later?

A. That is right.

Q. And it is put in by expanding the ductile ring 11 outwardly, and that deforms the clamp portion of the sealing flange 5, is that correct?

(Deposition of Reni J. Gits.)

A. That is right.

Q. You said that you made that same seal, and sold some, with a leather sealing flange in place of that synthetic?

A. That is right.

Q. And the date of that sale, was it October or September, 1933, an order for 74,000? Would you check your record? A. 9-28-33.

Q. That would be September 28, 1933, wouldn't it? A. Yes. [50]

Q. That was an order for 74,000? A. Yes.

Q. Do you have a blue print or anything showing that seal?

A. We gave you all the blue prints we had here.

Q. You mean, you gave them to counsel for the other side?

A. You see, we just started to make blue prints at that time. Prior to that, we made samples. You could get that better from Reeves. I don't remember that stuff. Do you remember Reeves telling us about that stuff?

Mr. Haight: Yes. We will get that when Mr. Reeves comes on the stand.

A. (By the Witness, continuing): I couldn't enlighten you on that. You would have to ask Reeves.

Q. (By Mr. Owen): What was the number under which that seal was sold?

A. I think it was 85.

Q. The same as this?

A. I read it from here. That's all I can say.

(Deposition of Reni J. Gits.)

Q. Do you have any samples of that seal among these samples that you have produced? [51]

A. I don't know.

Q. Do you want to look here?

The Witness Did we have some of those?

Mr. Owen: You are addressing Mr. Haight now?

Mr. Haight: I have not seen them.

The Witness: When you fellows left here, I have so much to do, that thing went out of my mind like that.

Mr. Geppert: We took nothing along with us.

The Witness: No, I don't think you did. I will have him bring up the samples.

(A short interruption.)

A. (By the Witness): Here is one. I think I ought to clean it a little more so you can see it better.

Q. (By Mr. Owen): This sample you have produced is not a complete sample, is it?

A. Well, there is your expanding ring. The superintendent will look a little further. I would like to get a complete one. He is looking for another one.

Q. You mean one out of those 74,000 that you made in 1933?

A. That is right.

Q. How soon were those shipped after that order was obtained?

A. That followed pretty quick. It was two or three thousand a day. We had to go very fast.

Q. How soon after the order, would you judge?

(Deposition of Reni J. Gits.)

A. I think about three months, that order was completed in about three months.

Q. When did you start shipping?

A. That I couldn't tell exactly. Maybe a couple of weeks, I should judge, because the experimental work and the tuning up was done while in process. I think in about a couple of weeks after the order was received.

Q. A couple of weeks after 9-28-33, you began to ship? A. Yes, that is right.

Q. When you put a leather sealing flange in place of the synthetic, and when the ductile ring 11 is expanded out to clamp the leather ring in the case, you get a deforming of the clamped portion of the leather member, do you not?

A. Not to affect the sealing member, because it is away down at the other end of the sealing [53] member.

Q. You are referring to the sealing lip?

A. Yes.

Q. I am not referring to that. I am referring to the clamp end of the seal, which is the end clamp in the case.

A. To start with, the leather fits here (indicating).

Q. You mean, it fits the inside bore of the shell?

A. That is right.

Q. Now, when the ductile ring 11 is expanded outwardly to clamp the leather member in the shell, the recess 12 would cause a deforming, or change the shape of that clamped portion of the leather member, wouldn't it?

(Deposition of Reni J. Gits.)

A. Very little. It would have to change it somewhat in order to fit. If it didn't change it, it wouldn't mean anything, it could be left the way it is. That is why we had that clamping there.

Q. To make it change its shape, and clamp tightly there, isn't that correct?

A. Yes. You see, I can hold much more with a knife edge than I can with something $1/8$ thick, with less pressure. [54]

Q. So that when this ductile ring was expanded out against the leather sealing member, it caused the deformation of the leather sealing member between those two metal parts?

A. Just as you see in there.

Q. Just as you see in the patent drawing?

A. Yes.

Q. So that the deformation is similar, whether it is a leather sealing member or a synthetic sealing member, so far as the clamping action is concerned?

A. Yes, but very little. We had to expand about $1/10,000$ ths.

Q. Wasn't the synthetic sealing member a tight fit when you put it in there? A. Yes.

Q. So that the deformation was substantially the same? A. Very, very little.

Q. You mean in leather, as well as in synthetic?

A. I think it was a little more in synthetic than it was in the other, because the rubber was much more uniform.

(Deposition of Reni J. Gits.)

Q. Are you familiar with what is known as cold flow in this matter of synthetic sealing members?

A. Well, that would be a cold flow. [55]

Q. No. I mean in this sense, Mr. Gits, that a synthetic member which has been moulded will begin to lose its resiliency, and will flow into a new shape, and will lose tightness. Are you familiar with that in this sealing business, with synthetics?

A. The only effect it had when it was heated up, if I got nothing above 180, I didn't get any flow.

Q. But it was when it got hotter?

A. When it got hotter, I would get flow.

Q. It would flow, and it would expand? That is correct?

A. Yes—it wouldn't necessarily expand. It would flow. It would flow where the pressure is. Wherever the pressure was, the rubber would flow.

Q. Then when it cooled down again, it would loosen up, wouldn't it?

A. It would practically stay in the position that that particular member that put the pressure on it put it. In other words, it moulded it again.

Q. Then, as it got hotter again, and got cold, and hot and cold, it would begin to loosen up, wouldn't it?

A. I don't know. I think you get less pressure on it. The first time it was heated, you had more pressure, it leaked further, it expanded more, it leaked more, that is, the rubber.

(Deposition of Reni J. Gits.)

Then the next time it didn't have quite that much, because the pressure was already released. That is the experience I had in synthetic rubber. It didn't necessarily leak because it flowed the first time.

Q. But as it repeated itself, got hot, and cold, then it would, in time, begin to leak there?

A. That is possible, that is possible. Maybe the first time it only got 180, and the second time 170.

Here is this box now. You can all have one.

Q. Looking again at your patent drawing 2,052,762, there are no holes in that radial flange 2 of the case, are there, into which the synthetic rubber is anchored, and that opening in the case, which is the numeral 3, in Fig. 3, is just a plain cylindrical hole, isn't it?

A. That is right.

Q. Then if that sealing member, that synthetic sealing member loosens up in there for any reason, there is nothing to hold it against spinning in that cylindrical bore 3, is there?

Do you want the question read? [57]

A. No, I understand what you mean. No, there is not. There is nothing except the expansion of the ring.

Q. And if it loosens up, there is nothing to hold it, anchor it from rotation?

A. No.

Q. Then as the ductile ring 11 in your seal is expanded out to fasten the sealing member in place, whether it is rubber or whether it is leather, it is simply compression fitting, compressing that sealing member in there? That is all that holds it, isn't it?

A. Yes, that is right.

(Deposition of Reni J. Gits.)

Q. That sealing flange is at room temperature, isn't it, when it is assembled in the case and the ring expanded? A. Yes.

Q. And that sealing flange, with its little flange 8, is not described in this patent as bonded to the radial flange of the case 2, is it?

Mr. Haight: The patent shows that. I do not think it uses the word "bonded."

A. (By the Witness): Of course, if you can go by the drawing, this thing is away on the outside here, you see. [58]

Mr. Owen: The witness is pointing now to the ductile ring.

Let me reframe my question.

The Witness: I know what you are talking about. When this thing comes over, that pulls that against it (indicating).

Q. (By Mr. Owen): Just a compression fit?

A. That is right, a compression fit.

Q. There is no bonding?

A. When this thing comes out this way, naturally it will pull down here.

Q. It is just a compression tightness?

A. Yes.

Q. There is no bonding?

Mr. Haight: You do not want this witness to give you a definition of "bonding," do you?

Q. (By Mr. Owen): There is nothing there but a compression fit of the sealing member against that radial flange, is that right?

(Deposition of Reni J. Gits.)

A. It is just like nailing a board to the wall.

Q. They are just pressing against each other?

A. Yes. [59]

Q. You have never made, then, and sold any devices like your patent 2,052,762 with a synthetic sealing member in them except for those experimental samples you furnished to Spicer?

A. No, we didn't.

Q. You have made and sold a large number of other types of oil seals, haven't you? A. Yes.

Q. Do you know how many million since 1935?

A. Oh, I don't know. It doesn't run into millions. I paid such a high royalty for those, that is how I worked on this, and that is how I got around that.

Q. Have you made a million oil seals?

A. I think so. I think, since then, we might have made a million oil seals; about two or three hundred thousand a year.

Q. Have you a file with your other patents in it, the other patents you have taken out, besides the one, 2,052,762?

A. What do you want it on? Oil seals?

Q. Yes, just the oil seal.

A. I will get them.

(A short interruption. Witness produces papers.) [60]

Mr. Owen: I am interested in copies of your issued patents. Thank you, very much.

(Deposition of Reni J. Gits.)

Q. (By Mr. Owen): You have produced here a sample of a seal having a leather sealing flange. Is that leather flange held in by an expanded ductile ring? A. Yes.

Q. Like your patent in suit, 2,052,762?

A. That is right.

Mr. Owen: I offer in evidence, as Plaintiff's Exhibit 1, sample of an oil seal produced by the witness.

(The sample of an oil seal so offered in evidence was accordingly marked Plaintiff's Exhibit 1.)

Q. (By Mr. Owen): That seal is like those 74,000 that you made and sold in September of 1933? A. That is right.

Q. The original tag which was on the oil seals marked Defendant's Exhibits D and E for identification, do you have that there? A. Yes.

Q. What does it say on that original tag? [61]

A. "Gits Synthetic Seal"—no. "Gits"—"Hydraulic Seals," is it?

Q. "Gits Hydraulic Seals?"

A. It looks that way. I don't know.

Q. Is that your writing? A. No.

Q. Is there any date on that tag? A. No.

Mr. Haight: Just to explain that, somebody in my office put that on.

Mr. Geppert: That is the reason I took it off.

Q. (By Mr. Owen): Then were there any tags on the seals Defendant's Exhibits D and E when you first located them for counsel for defendant?

(Deposition of Reni J. Gits.)

A. No, they were just in my regular safe, where I keep all my samples, and I put my reference labels on them.

Q. You have no date, or tags, or anything, on them, to indicate when they were made?

A. No. All I go by is the samples that I give the boys to take.

Q. Is it your usual practice to put date tags on samples when you make them? [62]

A. No, not as a rule, I don't.

Q. I call your attention to Defendant's Exhibit I for identification, and in particular to the ductile expanding ring, and, as shown originally in that tracing, in this blue print made from the original tracing, wherever the original tracing is, it shows no recess there to correspond with the recess 12 in the ring 11 of Fig. 4, does it?

A. Yes, it shows it there. It is pencil marked.

Q. But the original tracing and the blue print do not show it? It was put in afterwards, in a pencil change? A. Yes.

Q. Isn't that correct?

A. That is correct.

Q. The same thing is true of Exhibit H?

A. Yes, I think that was a copy from that, wasn't it? No, there seems to be something wrong somewhere. Is that a copy from there, or what?

Q. You mean, is H a copy from I?

A. Yes.

Mr. Geppert: It was a copy that you furnished us.

(Deposition of Reni J. Gits.)

A. (By the Witness, Continuing): That is from the original blue [63] print, then.

Q. (By Mr. Owen): Do you have the original tracing here? A. I think we have.

Q. Will you find it?

A. I will see if we have got it.

(Short interruption.)

Mr. Owen: We will go on while we are waiting for that to come up.

Q. (By Mr. Owen): Is Frank Zeman located here in Chicago?

A. Yes. You have his address, haven't you?

Q. Is M. A. Russell located here in Chicago?

A. Yes.

Q. The oil seal that you have referred to as Number 85, and which you said you had tested in your fixture, was never given a field test out in the field, was it? A. Oh, sure.

Q. By yourself?

A. By Tarbox, by the Spicer Corporation.

Q. You were not present when it was tested?

A. No. I delivered the samples, and I suppose the next day they put them in the shock absorbers.

Q. But you were not present, you do not know [64] that of your own knowledge?

A. No. According to the correspondence, they did.

Q. But that is just hearsay.

Do you have any drawings which would show the screw machine casing in which the sealing element of Defendant's Exhibit B was housed?

(Deposition of Reni J. Gits.)

A. You mean, if I have that screw machine part where this is inserted?

Q. Yes, or do you have any drawing showing it?

A. I don't think so, with me. I don't know.

Q. Could you sketch on a piece of paper what it was like, if you remember?

A. Yes, I have one here for you. I don't have two. I can give you one. There you are. Here is your ring. Here is your cup.

Q. Those are the parts of the seal which has been offered in evidence as Plaintiff's Exhibit 1, is that correct?

A. Do you see these grooves I have in here, to hold that leather in place?

Q. Yes. In other words, they are like screw threads.

A. It has got the same thing on the ring. [65]

Q. You have produced a seal like Plaintiff's Exhibit 1, taken apart. That is correct, isn't it?

A. That is right.

Q. And in those parts where you clamp the leather sealing member, on its outer periphery you have threads?

A. Or grooves, you could call them.

Q. Or grooves. And on the little ring that holds it in place, inside, you also have grooves?

A. Grooves.

Q. Are those rings on the little inside clamping ring, those grooves, are they threads, or are they just parallel grooves around?

A. Parallel grooves.

(Deposition of Reni J. Gits.)

Q. And those hold the leather?

A. Those hold the leather.

Q. And that is what you call that screw machine type of casing in your earlier testimony?

A. That is right.

Mr. Owen: I offer as Plaintiff's Exhibit 1-A the seal like Exhibit 1, which the witness has disassembled.

The Witness: This is another one of my inventions (indicating). From that we make our prints.

(The article, so offered in evidence, was accordingly marked Plaintiff's Exhibit 1-A.)

Q. (By Mr. Owen): You have produced the original tracing from which the print Defendant's Exhibit H for identification was made, and do you know when this original tracing was changed, and the indentation on the expanding ductile clamping ring was put in there?

A. That must have been about in——

Q. I mean, do you know actually when it was done. I don't want you to guess. Do you know? If you don't know, say so.

A. I don't know exactly when it was done.

Q. You do not know by whom?

A. It might have been done by Reeves up here, the draftsman. It was not done by Tarbox, because this was kept in our possession.

Q. But you do not know when it was done in your own plant?

A. No. It seems to me this thing was printed from that.

(Deposition of Reni J. Gits.)

Q. You are now examining Exhibit I?

A. No doubt this was done when this was presented to Rummler & Rummler, because this was always in [67] Rummler & Rummler's possession.

Q. But if you will look at Defendant's Exhibit I for identification, the blue print, those lines corresponding to the pencil changes on the original tracing are not on that blue print, made in the blue printing process, are they?

A. No, that was not done at the same time, but this was done, "Omit in main," this was done when it was presented to the patent attorney.

Q. By you? A. By me.

Q. Are you familiar with the Johnson patent 2,146,677 that is owned by the National Motor Bearing Company, and is in suit in this case?

A. I have a copy of it.

Q. Your company was never charged with infringement of that patent, was it? A. No.

Mr. Owen: That is all.

Redirect Examination

By Mr. Haight:

Q. On this question of the loosening of the rubber member, in the tests that you made, did that loosen? [68] A. No.

May I correct one thing?

If that gets hot enough to change its form, the seal is a flop.

Mr. Owen: Did it get that hot in any of your tests?

(Deposition of Reni J. Gits.)

The Witness: I had no trouble with that at all.

Mr. Owen: You never ran them at high temperature?

The Witness: Well, no, I don't think so. The only trouble we had was the rubber adhering to the shaft.

Mr. Owen: But you never tried what we call a temperature test on this particular seal?

The Witness: No, I don't think so.

Q. (By Mr. Haight): Something was said about leaking, when you were talking about the flow of the rubber.

Did the seals themselves, in their operation on the shaft, leak?

A. No, because you have that report from Tarbox that they are O.K.

Q. Something was said about the effect upon the rubber of expanding this expansible ring. In patent [69] 2,052,762 I notice on column 1, page 2, the following:

“Thus, when the clamping ring is expanded to secure the packing member to the shell flange, the clamping portion 5 of the packing member is forced into the groove 12 and at the same time that portion of the packing member that extends beyond or outside of the shell flange is extruded over the edge thereof so as to overlap its margin as at 13 in Fig. 1.”

A. That is right.

Q. Is that the way you made them?

(Deposition of Reni J. Gits.)

A. That is right. You look at it with this magnifying glass, and you see that exactly.

Q. There has been presented to you an oil seal that you produced with its leather member, such as was used to fill one of the orders that you referred to?

A. Yes.

Q. I have not seen this opened up. It has an expanding ring, within it, does it?

A. Yes.

Mr. Owen: Exhibit 1-A is the opened up one.

Q. (By Mr. Haight): In respect to that and the casing, it is the same construction as the one in which you used the resilient rubber?

A. That is right. It has got an expanding ring, and still has today.

Mr. Owen: How did you expand that ring, Mr. Gits, in Exhibit 1?

The Witness: I think it was done with a tool, with six or eight parts, that open up like this, something on that order (indicating). There are many ways of doing that.

Mr. Owen: I want to know how you actually did it.

The Witness: Yes. With fingers that open up (indicating).

Q. (By Mr. Haight): The expanding ring you are now talking about is the one that is shown in Plaintiff's Exhibit 1-A?

A. That is right.

Q. You have produced the original tracing here of drawing G.S. 998, which we offered on the record as Defendant's Exhibit H for identification.

I notice in this original drawing a little business

(Deposition of Reni J. Gits.)

down here near the bottom at the center, at the edge of the expanding ring. What is that? [71]

A. That is the recess in the ring.

Q. And that is like the recess in the ring shown in Plaintiff's Exhibit 1-A?

A. No. These are grooves all around. You have three grooves here, where you have only one there, a wider one. I don't know whether that makes any difference or not.

Q. No, we just want the structure. That recess is also shown, is it not, in Defendant's Exhibit H, at the same point? Look at it.

A. Yes, that is shown there.

(Following the taking of the depositions of Fred A. Reeves, James Zap and Beatrice M. Krejci, the witness Reni J. Gits was recalled as follows:)

Mr. Haight: I would like to recall Mr. Gits for just a couple of questions.

Redirect Examination

(Continued)

By Mr. Haight:

Q. Mr. Gits, you have just appeared, bringing some samples. I hand you one, and ask you what it is.

A. That is a Duprene seal, sealing member.

Q. And there is a tag upon it. What appears [72] upon the tag?

A. Figures.

Q. Do you know who placed those there? Do you recognize that handwriting?

(Deposition of Reni J. Gits.)

A. I think that is Reeves'.

Q. Is Mr. Reeves still here? I would like to ask him.

A. It is only parts. I don't know what it means.

Mr. Haight: I wonder if we can ask Mr. Reeves, if he can identify that handwriting.

I am going to have the back of this tag marked Defendant's Exhibit L, and the back of this one marked Defendant's Exhibit M, for identification.

(The tags referred to were accordingly marked Defendant's Exhibit L and Defendant's Exhibit M, respectively, for identification.)

Q. (By Mr. Haight): I am showing you this little member, with tag attached, that has been marked Defendant's Exhibit L. There are two dates upon it, 7-20-33, and 9-27-33.

What is that?

Mr. Owen: Sketches.

Q. (By Mr. Haight, Continuing): You brought this into the room. [73] Where did you get it?

A. I got it where I got all the other parts.

Q. The collection of things?

A. The collection of things.

Q. What does that represent?

A. That represents a sample of the sealing member.

Q. How does that compare, if you can compare it, with the sealing member shown on the sketch, Defendant's Exhibit C?

A. Well, that is identically what it is.

(Deposition of Reni J. Gits.)

Q. I show you an exhibit for identification, Defendant's Exhibit M. It has three members attached to it. A. That is the same thing.

Q. You just came in here with that. Where did you get it?

A. I got that from my box of parts, of experiments.

Q. What are those things?

A. That is the sealing member of the seal.

Q. What are they made of?

A. Some are Koroseal, and the other is Duprene.

Q. One of them is black in color, and two of them are brown. Can you identify what they are made of? [74]

A. Yes. This is the Koroseal.

Q. The two brown ones are Koroseal?

A. That is right. This may be Duprene—yes, this is Duprene.

Q. That is the black one? A. Yes.

Q. On this last assemblage of three, marked Defendant's Exhibit M, I notice upon the tag, "G. S. 1016," and then a date. What does that first symbol mean? A. "G. S."

Q. Do you know? A. No, I don't.

Mr. Haight: That is all.

Mr. Owen: Nothing further.

(Deposition closed.)

FRED A. REEVES

Direct Examination

By Mr. Haight:

Q. Will you state your full name?

A. Fred Alan Reeves.

Q. Where do you reside?

A. I live at 59th and Hathaway avenue, on Rural Route 2, in Downers Grove. That is my address. I live out of the incorporated limits of any town.

Q. What is your occupation?

A. I am Chief Engineer here.

Q. For Gits Bros. Mfg. Co.?

A. That is right, sir.

Q. How long have you been employed by that company?

A. I don't know the exact date. I can give you the year and the month. It was May, 1932. [76]

Q. When you first came here, what work did you do?

A. I was employed here as a draftsman.

Q. At that time, were there any other draftsmen here? A. No, I was the only one.

Q. Did you have any record of drawings at that time, when you arrived here?

A. When I came here, there were very few records of any kind, of any of the products. Any we have now have been made since.

Q. And how long did you continue as a draftsman?

(Deposition of Fred A. Reeves.)

A. More or less, I still am. How do you want that answered?

Q. That is a perfectly good answer. But when did you first get your position as engineer?

A. Well, I will tell you. Being the only engineer here in that work, I would say that, officially, I would be considered Chief Engineer from 1939, but my duties are the same and were the same ever since I have been here, up to the first of this year, probably.

Q. I show you a drawing that has been marked here for identification as Defendant's Exhibit C. Are you familiar with that drawing? [77]

A. I recall making it. That is my handwriting, or printing, I should say. These are my initials, just as I still make them today. The figures are all in my writing. Yes, I made that.

Q. "Gits Bros. Mfg. Co. Chicago 7/20/33 F.A.R."?

A. That is the initials, showing I drew it.

Q. You placed all of those upon this sheet, did you?

A. That is right. All of those pencil markings are mine.

Q. And you made the drawing that appears about the center of that sheet, did you?

A. Yes, sir, that is correct.

Q. From what, if anything, did you make that drawing?

A. I made that from a sample piece, having a shape that was cut in two, to make that section

(Deposition of Fred A. Reeves.)

view of it—that represents a section—to better illustrate all the dimensions of the part.

Q. And it was a piece of what. What was the material?

A. I believe it was Koroseal, either Koroseal or Duprene compound. It was a composition material. I would not recall at this date exactly which one it was. We had some of both. [78]

Q. Has the drawing been here in the possession of your company ever since?

A. I have had that in my engineering data file, because it has no drawing number assigned to it. We did not have a drawing system at the time those were made up, a registered number system.

Q. Did you ever see the device that is in the drawing put into an oil seal?

A. Yes, sir, certainly.

Q. Where?

A. Right here in the plant.

Q. What did those oil seals look like?

A. May I use one of these for illustration?

Q. Yes, you may.

A. It was a seal something on the type of this one, this one, or this one (indicating).

Mr. Owen: The witness is referring to Plaintiff's Exhibits 1 and 1-A.

Mr. Haight: I will get to that.

Q. (By Mr. Haight): Any others?

A. This one here, too, except there were some variations conducted at the time in the form. This one has a little different form in the back, but the material, in general form, is the same. [79]

(Deposition of Fred A. Reeves.)

Q. You have referred to what we have called here Plaintiff's Exhibit 1, and Plaintiff's Exhibit 1-A, and Defendant's Exhibit D.

A. That is right.

Q. When you speak about the form, what do you mean, in respect to this Defendant's Exhibit D?

A. This illustration, at the time that it was made, was made from a piece that has the back end of this in this arrangement, as one of the methods used for holding it, it is shaped slightly different from the other ones. This one had a ring in it, as this one had.

Q. All the time, you have been talking about the one on the drawing? A. Yes.

Q. You have just referred to this one here, which is Defendant's Exhibit D?

A. Yes. All right. Defendant's Exhibit D has the same method of holding it in here, that is, the expansion ring. That is the part that was on the drawing. Of course, the ring is not shown on the drawing, it is strictly the moulded part, the composition.

The only other difference is in the slight flange that comes up here to keep this one going, [80] because this one had the flange on the metal part.

Q. What flange are you referring to, in Defendant's Exhibit D?

A. I am referring to this stop flange here.

Q. That is in this cut portion, in this section?

A. That is right, in this section view, the composition is formed into a flange immediately in

(Deposition of Fred A. Reeves.)

front of the metal portion, to act as a stop in indexing the part into the metal piece.

Q. When you look at the bottom of the cup, as I recall it, in Defendant's Exhibit D——

A. It looks identical to the one on the drawing.

Q. (Continuing): ——how does that compare with respect to its surface with Plaintiff's Exhibit 1?

A. Wait a minute. I wish to ask for clarification of what you want to know.

Q. All right.

A. This seal is without the additional felt retainer in the back of it. The leather or composition that was used in some of them, from where it is fastened in the metal behind that felt, would look exactly as this does, at the back.

Q. That is, like Defendant's Exhibit D does at the back?

A. That is right. There is only the addition [81] of the felt.

Q. Let us talk about Defendant's Exhibit D. You called attention to the cross-section, where it had been cut.

A. That is right, the form of the metal.

Q. That does not go on the same plane all the way. Can you see that on the back or bottom of the cup? A. Yes, you can.

Q. That is, that is not all in the same plane?

A. No, that is right. There are two different planes.

(Deposition of Fred A. Reeves.)

Q. What I was talking about was in this Defendant's Exhibit D, what you call the flange is inwardly offset at that point?

A. That is correct.

Q. I show you another drawing, or a print, dated 4/16/1934, which we are calling here Defendant's Exhibit H for identification.

Are you familiar with that?

A. Yes. I made that drawing.

Q. And you also have before you here, have you not, the original tracing?

A. That is correct.

Q. When did you make that, Mr. Reeves? [82]

A. I made that. The date upon the drawing is the date the drawing was completed. The actual drawing of that was started a day or two before, because it has been a policy of mine here, in making those things, that it served both as a layout and as an assembly drawing, therefore, great care was taken in making the drawing so that the relationship of a dimension to the picture is actually to scale, as far as it is practical to make it.

Q. What is anything did you have before you when you made this drawing, Defendant's Exhibit H?

A. That was made from a sample seal of that construction. In other words, I had the article, whether I had just one sample, or more. It has been customary, when I have made anything like that, to have several samples, and I would either myself, or they were furnished to me, cut cuts so as to see the section view.

(Deposition of Fred A. Reeves.)

Then I had one of the individual parts, of which I could take the micrometer measurements, and reassemble it, and then check it, and reassemble it.

Q. Did you actually test any of these yourself, Mr. Reeves?

A. Operating tests, you mean?

Q. Yes.

A. I had an interest in it. Some of it, not [83] altogether. That is, not that I completely tested them, but in association with others in the concern.

Q. What kind of tests did you have to do with?

A. They were operated on shafts here, with test fixtures that we had, that consisted of a revolving shaft, in which seals were placed and tested as a unit, and they were run at various speeds, up to somewhat beyond the average motor speed, which is 1800 r.p.m., and tests for durability, and leaks, and wear, and those tests would take as much as a week, before any of them were completed, or records made of any kind.

Q. How did they work?

A. The seals worked satisfactorily. The one right there worked very satisfactorily.

Q. I have called your attention to one of these samples, Defendant's Exhibit E. Are you familiar with that?

A. Both Defendant's Exhibit E and Defendant's Exhibit D are identical, except that one shows a section view, a piece has been cut out to show a section view, and the other one is the whole part, a portion of a completed seal.

(Deposition of Fred A. Reeves.)

Q. In making some of these tests here in the plant, such as you did make here, when were those made in [84] reference to the time you made this drawing?

A. Those were made before the drawings. The reason for that was that Mr. Gits made these samples, as far as assembling it, and he made some of the parts himself, and of course, other employes in the plant, where machine workers were involved. For example, the shells, where the outside case was made in the punch press department, and during that time, after those were assembled, the various models were tested, of which this Exhibit H is one, they were tested after they were assembled, before drawings were made of them.

Q. Your attention has been called to Plaintiff's Exhibit 1. A. Yes.

Q. What is the sealing member in that, of what material, if you know?

A. This is leather material.

Q. Did you have anything to do with the manufacture of any of those, or like those?

A. Yes. I made drawings of dies for forming leathers, and drawings or sketches of some sort of this metal, brass housing, which this is formed into. And the method of holding this seal, the sealing member, is done in the same manner that was used on the [85] parts shown on Defendant's Exhibit C, and there was also used the same form of holding it as shown on Defendant's Exhibit D and Defendant's Exhibit E.

(Deposition of Fred A. Reeves.)

Q. Is there any custom obtaining in this plant in regard to your correspondence, that is, letters that the company receives, and copies of letters it sends, as to the keeping of them? Do you have any custom?

A. You mean, keeping the records?

Q. The keeping of your letters, the correspondence?

A. How do you mean that? Like how long we keep them?

Q. Yes, how long do you keep them?

A. The policy here is that after the fifth or sixth year—I should say after the fourth or fifth year, the entire correspondence files for that oldest year are destroyed, they burn them up.

The reason for that is, we have no facilities here to keep any files of that kind. It has been our policy to do that for a great number of years, as long as I have been with the concern.

Q. Notwithstanding that, have you made any search to see if there is any older correspondence, going back to these years 1932, '33, '35, in there?

A. In relation to this subject? [86]

Q. Yes.

A. With relation to this seal part, I did, but I could find no record whatever of any kind, as far as correspondence or purchases of material for that, because those are also destroyed, on the same basis.

Mr. Haight: You may cross-examine.

(Deposition of Fred A. Reeves.)

Cross-Examination

By Mr. Owen:

Q. Looking at Plaintiff's Exhibit 1, how was that clamping ring tightened in there, or was it tightened in any way?

A. Yes, it was done with an expanding tool, a tool that makes it expand.

Q. I believe your testimony is that the manner of holding the sealing member in Exhibit 1, as well as in Exhibit D and Exhibit E, and in the devices shown in the patent 2,052,762, was substantially the same?

A. That is right, yes, sir.

Q. In these tests that you say were run, did any of those seals score the shaft?

A. I do not recall of any instances where it happened. If they had, there would have been something [87] made to correct the situation in the seal. I do not recall of anything of that sort.

Q. The flange which you have referred to, which is No. 8 in the patent drawings of 2,052,762——

A. That is correct.

Q. (Continuing): ——you said that was for indexing it in the outer case, in other words, positioning it.

A. That is right, positioning it.

Q. That was not bonded or cemented to the inner shell?

A. No, it was not bonded or cemented to the inner shell.

(Deposition of Fred A. Reeves.)

Q. You relied solely on the expansion of this ductile ring 11 to clamp the sealing member in the outer shell? A. That is correct.

Q. And there were no holes or any means of interlocking the sealing member to the outer shell flange? A. No, there were not.

Mr. Haight: When you say "holes," you are referring only to the holes, where it says, "Other means of interlocking"?

Mr. Owen: Yes. Yes, holes or other means through the radial flange of the outer shell. [88]

Q. (By Mr. Owen): You understood that?

A. Yes, sir, I understood that. The expanding ring held the part in, nothing else, no cement used.

Q. There was no interlocking?

A. No additional holding of any kind.

Mr. Owen: That is all.

(Following the depositions of James Zap, Beatrice M. Krejci, and the recalling of Reni J. Gits, the witness Fred A. Reeves was recalled, as follows:)

Redirect Examination

By Mr. Haight:

Q. I show you, Mr. Reeves, Exhibit L. Are you familiar with that? A. Yes, sir.

Q. What is it?

A. That is an actual part of what is sketched on the two sketches, the original sketches. That is one of them.

(Deposition of Fred A. Reeves.)

Q. You say that is one of them. You are identifying Defendant's Exhibit C?

A. Defendant's Exhibit C.

Q. Any other sketch? [89]

A. I haven't seen the other one, it has not been presented to me, to my knowledge. There is another one, yes. The other date signifies the other sketch on which this part is.

Q. I notice at the top of this card the following: 7/20/33. Do you know who placed that there?

A. I did.

Q. Do you know when you placed it there?

A. You mean the date I placed it on there?

Q. Yes. It bears this date.

A. It bears this date, yes. I placed this on here recently, when I took these parts that go with that drawing so as to identify the part, the sketch referred to on the back.

Q. What is the other entry upon it, 9/27/33?

A. That is the date of another sketch, showing also this part.

Q. Let me see if I can sum this up. This Exhibit L is an actual member that is shown in two sketches.

A. That is right.

Q. But those entries you made fairly recently?

A. That is correct.

Q. Just to identify them?

A. That is right. [90]

Q. On Defendant's Exhibit M, we have three members. Do you recognize those?

A. That is correct. The first one, G. S. 1016, is

(Deposition of Fred A. Reeves.)

our Drawing number, and the other line is 12/14/33, that is the date upon that drawing.

Q. When did you make the entries upon that card, on the back?

A. At the same time they were made on the other ones.

Q. That is, fairly recently? A. Yes, sir.

Q. I notice on this exhibit, two numbers that are brown, and one is black. Do you know what they are, respectively?

A. Yes. These light colored brown ones, as you call them, are Koroseal compounds, and the dark one, that is Duprene, what was known as Duprene at the time. You can tell by the smell.

Mr. Haight: You may examine.

Recross-Examination

By Mr. Owen:

Q. Where is that sketch of 9/27/33? Do you have it? A. No. [91]

Q. Is it just a duplicate of the other, of 7/20/33?

A. You had some drawings here, which you took those out of, you had the original. The drawing is on an old style form. There is no drawing number on it.

Mr. Owen: Also see if you can find that G. S. 1016.

Mr. Haight: Off the record.

(Discussion off the record.)

(Deposition of Fred A. Reeves.)

Redirect Examination

By Mr. Haight:

Q. Mr. Reeves, you have produced here another drawing. What is this, an original?

A. It was an original sketch. At the time it was made, we had no drawing system here, and it was just drawn on the paper.

Q. I notice it is dated 9/27/33, and down at the bottom it has "Sketch of Koroseal or Duprene Seal for Spicer Manufacturing Corporation."

A. That is correct.

Q. The structure shown seems to me to be a drawing, but a reverse of Defendant's Exhibit C, the drawing of 7/20/33, isn't it?

A. Yes. The sectional area is identical to [92] Defendant's Exhibit C.

Mr. Haight: In view of that, I see no necessity for placing it on the record.

The Witness: These are fractional figures. These are decimally given, even to the tolerance of the specific part. They are identical otherwise.

Mr. Haight: In view of the fact that it is identical with Defendant's Exhibit C, I see no necessity of placing it on the record.

Mr. Owen: That is agreeable.

Recross-Examination

By Mr. Owen:

Q. Can you find that drawing, G. S. 1016, that was referred to a minute ago here?

(Deposition of Fred A. Reeves.)

A. Here it is. That is the same thing. That is a ring. It has circular grooves.

Mr. Owen: Inasmuch as there is nothing in the record to show the details of this Plaintiff's Exhibit 1 and Plaintiff's Exhibit 1-A, I suggest that the print, G. S. 1016, be introduced.

Mr. Haight: All right.

Mr. Owen: That is what it relates to. [93]

The Witness: Yes. It relates to those things.

Q. (By Mr. Owen): You mean, Exhibit 1?

A. That is right, Plaintiff's Exhibit 1.

Mr. Haight: I will offer it in evidence, then, as Defendant's Exhibit N.

(The document referred to, so offered in evidence, was accordingly marked Defendant's Exhibit N.)

(Deposition closed.) [94]

JAMES ZAP

Direct Examination

By Mr. Haight:

Q. Will you state your full name?

A. I go here under the name of James Zap, but my name is Zapivovarsky.

Q. What is your first name? A. James.

(Deposition of James Zap.)

Q. But you are commonly called James Zap?

A. That is right.

Q. What is your address?

A. 6225 Pershing Road.

Q. In Chicago?

A. That is Berwyn, Illinois.

Q. What is your occupation?

A. Shop Superintendent.

Q. For what company? [95]

A. Gits Brothers.

Q. Gits Bros. Mfg. Co.?

A. That is right.

Q. We are in their plant here today, are we not?

A. Sure.

Q. How long have you been connected with that company?

A. I am sure it is twenty-seven years this spring past. It will be twenty-eight this coming May.

Q. Have you been Shop Superintendent from the beginning?

A. No, sir. I have been Shop Superintendent for ten years.

Q. Before that, what were you?

A. I was set-up man, and foreman in the press department.

Q. What were you along during the years 1932, '33, '34, along in there?

A. That is what I was, set-up man, superintendent.

Q. I show you a drawing that we are calling here Defendant's Exhibit C. Are you familiar with that drawing?

A. Yes.

(Deposition of James Zap.)

Q. Did you have anything to do with it?

A. Well, yes. I helped produce the dies on [96] that. I also moulded the leather parts that were on here.

Q. Did you put out any product, any oil seals that had a leather sealing member?

A. That is right, for Spicer.

Q. Then did you later make some with rubber composition material?

A. Whether we produced that or not, I wouldn't be too sure. I fooled with it, I used some tools to fasten them, and I think we made samples.

Q. I show you another drawing, a photostat, which we are calling here Defendant's Exhibit H, dated 4/16/34.

Are you familiar with that?

A. Oh, yes. I made the shells for that, the outer shells for that, the metal part.

Q. How are they made?

A. The metal part?

Q. Yes. A. Off of stamping.

Q. Do you see anything before you on the desk here that illustrates the structure of that drawing?

A. Here, these shells here.

Q. You have picked up a shell that has been marked Defendant's Exhibit E for identification, and another one that has a section cut out, that is marked Defendant's Exhibit D.

A. That is right.

Q. You were familiar with those back during that time? A. That is right.

(Deposition of James Zap.)

Q. I now show you another set of exhibits, three of them, all marked Defendant's Exhibit G.

Are you familiar with those?

A. That is right. That is the same thing right there. That is before that piece had been modeled.

Q. When you say, "That is the same thing right there" you are referring to Defendant's Exhibit E?

A. That is right.

Q. You had to do with the making of those, did you? A. That is right.

Q. Back during what time?

A. That is in about 1933, sometime the later part of 1933.

Q. Do you know of any custom here in regard to the making of drawings? Do you make your drawings first, and make your article afterwards, or do you make the article first, and make the drawing afterwards? [98]

A. That is what we used to do here before, we would work on the samples, and then later on make the drawings, after we had something worked out.

Q. I notice these offsets in Defendant's Exhibit G, also in Defendant's Exhibit D and E. I do not see any on the back of Plaintiff's Exhibit 1.

A. This is from a bar. It would not be necessary on this.

Q. How were those made?

A. Those were made on a screw machine.

Q. And these others, Defendant's Exhibits G, D and E, they were made on what kind of a machine?

(Deposition of James Zap.)

A. That is on a punch press, that is the little stamping, but the part that really goes in there was also made on the screw machine.

Mr. Haight: That is all.

Cross-Examination

By Mr. Owen:

Q. You mean the expanding ring was also made on the screw machine? A. Yes.

Q. Have you any record of the dies from which you made the parts like Exhibit G? [99]

A. I am afraid not. That is all hand made, and as we go along, we make parts, and so forth, for that.

Q. The sealing member shown here in Exhibit C for identification was leather?

A. Yes. We have two dies for that.

Q. For forming the leather?

A. That is right.

Mr. Owen: That is all.

(Deposition closed.) [100]

BEATRICE M. KREJCI

Direct Examination

By Mr. Haight:

Q. Will you state your full name?

A. Beatrice M. Krejci.

Q. And where do you live?

(Deposition of Beatrice M. Krejci.)

A. 2614 South Homan, Chicago.

Q. What is your occupation?

A. I am bookkeeper, and Mr. Gits' personal secretary.

Q. Employed by Gits Bros. Mfg. Co.?

A. By Gits Bros. Mfg. Co., correct.

Q. How long have you been connected with that company? A. Nineteen years.

Q. Are you also a notary public?

A. Yes, I am. [101]

Q. I am showing you a document, that we are calling here Defendant's Exhibit I for identification. Do you find anything in your handwriting thereon?

A. Yes, my notary affidavit.

Q. That is, these words, "Subscribed to before me this 16th day of April, 1934. Beatrice M. Krejci, Notary Public?" A. That is right.

Q. And you wrote that at what time?

A. At what time?

Q. Yes, what date?

A. Well, the date that was on that.

Q. And affixed your notarial seal at that time?

A. That is correct.

Q. At the time you placed that on there, were these other signatures upon this document?

A. Yes, they were.

Q. Of Mr. Gits, Mr. Zeman and Miss Russell?

A. That is correct.

Mr. Haight: That is all.

(Deposition of Beatrice M. Krejci.)

Cross-Examination

By Mr. Owen:

Q. Do you keep any record of the things that you notarize? [102] A. No, I don't.

Q. Does the law require that notaries keep a record, or a book?

A. I don't think so. Most of the things I am required to notarize are Canadian affidavits. I do not keep a record.

Mr. Owen: That is all.

(Deposition closed.) [103]

Mr. Haight: I would like to offer at this time all the exhibits produced on behalf of the defendant except that group of letters, Defendant's Exhibit J, and the drawing, Defendant's Exhibit K.

(The said documents, so offered in evidence, being Defendant's Exhibits A, B, C, D, E, F, G, H, I, L, M and N.)

Mr. Haight: May we waive the signatures on these depositions, and if any corrections are to be made when Mr. Owen sees them, we can very easily handle that.

Mr. Owen: That is agreeable, and if there is any question between us as to corrections, we can put it up to the witnesses, and find out what it is.

Mr. Haight: That is entirely satisfactory.

It is also stipulated in regard to exhibits offered by the respective parties, that they may be retained by counsel, subject to production on notice, and so forth.

Mr. Owen: That as soon as the depositions are completed, they will be filed, along with the original transcript. [104]

Mr. Haight: It is so agreed.

(Which were all the proceedings had upon the taking of depositions herein at the time and place aforesaid.)

[Seal] EARL W. RADFORD,
Notary Public, DuPage
County, Illinois.

My Commission expires September 8, 1949.

[Endorsed]: Filed U.S.D.C. Oct. 10, 1945.

[Endorsed]: Filed U.S.C.C.A. May 21, 1947.

In the United States District Court for the Northern
District of California, Southern Division

Civil Action No. 23697G

Suit for Infringement of
Letters Patent No. 2,146,677

NATIONAL MOTOR BEARING CO., a Corpo-
ration,

Plaintiff,

vs.

CHANSLOR & LYON CO., a Corporation,
Defendant.

Depositions of

FRED L. HAUSHALTER and
G. L. TARBOX,

taken at Toledo, Ohio, October 5th, 1945.

Present:

On behalf of Plaintiff: A. Donham Owen, Esq.,
2110 Mills Tower, San Francisco 4, California.

On behalf of Defendant: George J. Haight, Esq.,
Chicago, Illinois; Carl F. Geppert, Esq., Chicago,
Illinois.

STIPULATION

It is hereby stipulated by and between counsel
for the parties hereto that the deposition of Fred
L. Haushalter may be taken at the Spicer Manufac-
turing Company, Toledo, Ohio, on the 5th day of
October, 1945, instead of the time and place men-
tioned in the notice hereto attached.

FRED L. HAUSHALTER

of lawful age, being by me first duly cautioned and sworn as hereinafter certified, deposes and says as follows:

Direct Examination

By Mr. Haight:

Q. Mr. Haushalter, will you state your name?

A. Fred Lee Haushalter.

Q. Where do you reside? A. Akron, Ohio.

Q. What is your business or profession?

A. I am a Development Engineer of rubber products.

Q. What connection have you at the present time?

A. I am connected with Baldwin Rubber Company at the present time, of Pontiac, Michigan.

Q. Were you ever employed by the B. F. Goodrich Rubber [2*] Company, of Akron, Ohio?

A. Yes, sir. I was with Goodrich twenty-five years.

Q. What years were you in their employ?

A. 1919 to 1944.

Q. During the years 1933, '34 and '35, what was your position with that company?

A. I was a Development Engineer in the New Products Department.

Q. Who was the head of that department?

A. J. D. Beebe.

* Page numbering appearing at top of page of original Reporter's Transcript.

(Deposition of Fred L. Haushalter.)

Q. Were you at that time acquainted with the Spicer Manufacturing Company?

A. Yes, sir. I was well acquainted with Mr. Tarbox, with whom I worked on rubber parts for Universal Joints in particular.

Q. When did you first start to work on rubber parts in connection with Mr. Tarbox; about what time?

A. You mean for other parts than seals?

Q. No, just for seals.

A. Just particularly for seals?

Q. Yes.

A. Well, it was about the middle of 1933.

Q. I show you a letter which is marked for identification as Defendant's Exhibit O. I said a letter, —it is a copy of a letter and it will later appear, I think, that this came from the regular files of the Spicer Manufacturing Company in charge of Mr. Tarbox. Are you familiar with that instrument?

A. Yes. I recognize that because previous to this I had given Mr. Tarbox slab of our Koroseal which is a new synthetic that Dr. Seman of Goodrich developed.

Q. Do you know the purpose for which it was to be used?

A. Well, Tarbox told me he was having trouble with the seal on this direct action shock absorber on which they got into production and then had to recall from production because of the fact the seal was leaking on this small shaft. Of course the com-

(Deposition of Fred L. Haushalter.)

pany was bringing pressure to bear on them to lick this seal problem and he was given the job of getting a satisfactory seal and particularly of material that would be an improvement on leather which seemed to leak, particularly on this small shaft.

Q. Did you see the device to which this was to be applied? A. The shock absorber?

Q. Yes.

A. Oh yes, I took the whole thing apart. We looked over the whole assembly.

Q. I show you another letter which for identification has been marked Defendant's Exhibit P, dated May 20th, 1933, apparently on the letterhead of the B. F. Goodrich Rubber Company, signed by that company. Whose signature is that, if you know? A. That is my signature.

Q. I note that that letter said, "I was glad to know [4] that you think our synthetic rubber has a possibility of success as a seal on your new type of shock absorber." Did you at that time do anything further with respect to furnishing such material?

A. This letter apparently was in reply to that previous exhibit. We gave him, then, further slabs of material from which Tarbox machined the first samples that were tried in his shock absorber. We proposed to build them single cavity mold material. He did not want to wait, so he took the slabs and machined them out on the lathe before molded samples were produced.

(Deposition of Fred L. Haushalter.)

Q. I show you a copy of a letter from the same source heretofore stated which has been marked by the reporter for identification as Defendant's Exhibit Q. Can you identify that as having been received from Mr. Tarbox?

A. Yes. I recognize that. He gave us an order then, to cover the material.

Q. What was that material?

A. We gave him about three types of synthetic rubber. Just which one we are giving him here—we had the Koroseal; then we had Duprene which was later changed to Neoprene with Duprene synthetic, and then we also gave him natural rubber.

Q. I show you another letter dated June 26th, 1933, on the letterhead of the B. F. Goodrich Rubber Company, which the reporter has marked Defendant's Exhibit R. Do you recognize the signature at the bottom of that letter?

A. Yes. That is my signature. [5]

Q. Does that refresh your recollection on looking at it as to anything that you did at that time?

A. Well, we made a single cavity mold and molded this material, samples of this oil resisting stock in the black Dupreme from a single cavity mold, and was shipping it to him for a trial in his shock absorber. This material here, 3RT-14 is Koroseal.

Q. I have in mind, Mr. Haushalter, the original of the drawings that were identified on the record as Defendant's Exhibit B, and with your permission—I am not going to mark the original—but will

(Deposition of Fred L. Haushalter.)

leave the witness and Mr. Tarbox identify the original.

Mr. Owen: That is all right.

Q. I show you a drawing of which Defendant's Exhibit B is allegedly a copy or photostat. In looking at the original, do you recognize that?

A. Yes, I recognize that sketch. It is really a drawing.

Q. Do you know who made that drawing?

A. I made the actual drawing. Those are my figures and my lettering.

Q. Do you recognize the handwriting appearing upon the paper below the drawing itself?

A. Well, I could not swear to the handwriting as to whose that is.

Q. I notice that it says drawn by Mr. Tarbox, Gits and Haushalter, June 30th, 1933. Prints obtained by Gits and Haushalter." [6]

A. That is not my handwriting.

Q. Do you remember when that sketch was made?

A. After making the samples that Tarbox referred to in these previous exhibits, Tarbox is merely trying to make a seal out of different materials and they did not make out, so he was contacting various people who might know something about seals. I imagine he contacted about a half dozen companies.

Mr. Owen: I object to anything that you do not know of your own knowledge.

(Deposition of Fred L. Haushalter.)

A. Well, I merely knew that from the fact he called me into the picture with Mr. Gits on this occasion. In other words, I was called over here one day with Mr. Tarbox. It apparently was June 30th, 1933.

Q. Who did you meet? A. Mr. Gits.

Q. Did you ever meet Mr. Gits before that time?

A. No. I never met Mr. Gits before.

Q. Did you and Tarbox and Gits have a discussion on that day?

A. Yes. The three of us got around Tarbox's desk. It was in the old building. This is the new building, here. It was the same type of laboratory, and we discussed the quality. Tarbox had the samples that I had previously sent him in the first two previous exhibits. Without analyzing the troubles he had with this in his tests and the leakage he had, we sat down and tried to design a seal that would overcome those difficulties, and this sketch is a result of that conference. I made a drawing after we agreed on the [7] tolerances on these features. For instance this .409, .412, a tolerance on that which had to fit the small shaft.

Q. Can you tell us the dimensions of the shaft; that is, its diameter?

A. The shaft is a half-inch rod.

Q. You identified Mr. Beebe as manager of the New Products Department, the chemical division of the B. F. Goodrich Rubber Company. I show you a letter which the reporter has marked for iden-

(Deposition of Fred L. Haushalter.)

tification Defendant's Exhibit S. Do you know the signature on that letter?

A. That is Beebe's signature, and he was my boss.

Q. I now show you a letter which came from the files of the Spicer Manufacturing Company, I think it will be shown, and a copy of it already appears in Defendant's Exhibit J on this record, but I will show you a copy that I think we will show came from the Spicer Company files. Are you familiar with that letter addressed to Gits Brothers Manufacturing Company?

A. Yes. In other words, after we designed this seal, we apparently had to mold it in a mold and a single cavity mold was then made to produce seals to that sketch.

Mr. Owen: You mean sealing member when you say seal?

A. Yes, sealing material or sealing member.

Q. You are referring to the sketch of June 30th, 1933? A. That is right.

Q. Which is on the record as Defendant's Exhibit B. Calling your attention to this letter of July 15th, 1933, do [8] you know anything about the samples therein referred to?

A. Well, these eight samples here is the Koro-seal Compound which is the same material as the slab we previously sent him, 3RT-14.

Q. What can you tell us of the eight samples of Dupreme Compound?

(Deposition of Fred L. Haushalter.)

A. This is the same as the Dupreme slab we sent him previously.

Q. Were those samples sent?

A. Yes. Those samples were sent. Gits received this material and assembled that resisting material into a seal.

Mr. Owen: We object because you don't know whether he assembled them or not because you were not there.

A. But I have seen them after they assembled them.

Q. I show you a letter which for identification has been marked Defendant's Exhibit T on the letterhead of the B. F. Goodrich Rubber Company dated July 19th, 1933, addressed to Mr. Tarbox. Do you recognize the signature at the bottom of that letter? A. That is my signature.

Q. That refers to the sending of certain samples therein described. Do you recall whether or not those were sent?

A. Yes. Those samples were sent and we cut the mold to overcome some of the difficulty that appeared on the first samples that we tested. I had frequent contacts with [9] Gits myself. He stopped at Akron three or four times to go over this after we made samples and we had sent the stuff to him.

Q. I show you another letter which I understand came from the files of the Spicer Manufacturing Company. A copy of it has already been identified in the record as part of Defendant's Exhibit J. This

(Deposition of Fred L. Haushalter.)

is a letter of August 11th, 1933, from the Goodrich Rubber Company to the Gits Brothers Manufacturing Company. Do you recall anything about the forwarding of oil seal rings made in accordance with the sketch dated 7-20-33?

Mr. Owen: I object to this witness testifying to this letter because he did not write the letter and there is nothing on it to indicate he has any knowledge of it.

Q. I am asking the witness, do you recall anything about this transaction?

A. Mr. J. E. Thomas was the correspondent in our department. We only had a very small department. There was only about four of us in it. At times, when I was away, Thomas would forward samples that were made upon my order, and these were some of them because these rings that were used in sealing material to extend it into the housing, we molded some of our sealing material with those rings right in the mold.

Q. Where was that done?

A. That was done at Akron.

Q. Did you have anything to do with the actual manufacturing of these synthetic rubber molds with the ring imbedded? [10]

A. It is on my order that these were molded because I had the mold changed to incorporate the brass ring in the mold.

Q. I am placing this next one out of Mr. Tarbox's file, out of order, but I am not going to in-

(Deposition of Fred L. Haushalter.)

terrogate this witness about it. It already appears in Defendant's Exhibit J. That is the letter of August 24th, 1933, to Gits Manufacturing Company from the B. F. Goodrich Company, J. E. Thomas, copy to Tarbox. The next letter is one of August 30th, 1933, to Gits Brothers Manufacturing Company from the Goodrich Rubber Company, J. E. Thomas, with copy to Tarbox, which is also in Defendant's Exhibit J. Also, I am placing in its regular place the August 31st letter, 1933, to Gits Brothers from Goodrich, copy to Tarbox.

Mr. Owen: Just so the record is clear for what is being done, we are preparing for the convenience of a subsequent examination of another witness. Mr. Haight is arranging them in order.

Mr. Haight: That is correct. I am doing the same with the next two letters, September 1st, 1933, Goodrich to Gits, and one of September 5th, 1933, Goodrich to Gits.

Q. I am showing you what appears to be an original letter, photostatic copy of which is already contained in Defendant's Exhibit J. This letter is on the letterhead of B. F. Goodrich Rubber Company dated September 25th, 1933, addressed to Spicer Manufacturing Company, attention of Mr. Tarbox. Do you recognize the signature thereon?

A. Yes. That is my signature.

Q. Does your examination of that letter signed by you, enable you to tell us whether or not you know there were fifty each of the seals of Koroseal and Dupreme?

(Deposition of Fred L. Haushalter.)

A. Yes. Gits made the brass rings. They had to be made a certain size. Then he would ship them in to me and we would cure them in the mold.

Q. A copy of the letter therein referred to also September 25th, 1933, to Gits from Goodrich, which I will place in its order. It is already in Defendant's Exhibit J. I show you a copy of a letter which I think will appear, which came from the files of the Spicer Manufacturing Corporation dated November 7th, 1933, addressed to the Goodrich Rubber Company, attention Mr. Haushalter, apparently sent by Spicer Manufacturing Corporation, G. L. Tarbox. Will you examine that and see if you have any recollection concerning it?

A. Well, I recall that Koroseal when it first came out. We did not know much about it and some of our research men were rather unwilling to release it until we had done more work on it. This sealing material was really the first molded job that was ever made of this new synthetic material and the plasticising of it had not been thoroughly worked out; the plasticising of the material chemically, and the research men were hesitant about releasing it, but they later changed their minds when we actually showed them it could be molded.

Q. I show you a letter which for identification has [12] been marked Defendant's Exhibit V, on the letterhead of the B. F. Goodrich Rubber Com-

(Deposition of Fred L. Haushalter.)

pany dated November 15th, 1935, addressed to Spicer Manufacturing Corporation, attention Tarbox, with the legend, B. F. Goodrich Rubber Company, and signed. Do you recognize that signature?

A. That is my signature. At this time,—you see, this is a new material and special equipment had to be set up to produce it and Goodrich was working with National Carbide Company on the plasticizer for the material. A certain amount of material had to be set up to produce it in quantity. Up to this time it had only been produced in extremely small quantities. So the question came up as to whether they were able to go into production at this time because of shortage of facilities for producing it. Unless they had sufficient quantity to start production on, they were not interested, see?

Q. I show you a copy of a letter marked Defendant's Exhibit W for identification. I am advised that this came from the files of the Spicer Company but we shall later see about that, addressed to the Goodrich Rubber Company, and signed for the Spicer Manufacturing Company by Tarbox. Do you know whether or not Spicer was in production on that at that time?

This is November 20th, 1933. I recall that they were in production on the shock absorber at that time.

Q. I show you another copy of a letter from the same source as I am at present advised, con-

(Deposition of Fred L. Haushalter.)

sisting of two pages, [13] and for identification, marked Defendant's Exhibit X. It seems to be addressed to the Goodrich Rubber Company, attention of Haushalter. It seems to be signed Spicer Manufacturing Company, G. L. Tarbox. Do you remember anything about that letter?

A. Well, yes. I recall Tarbox wanted to get away from the Gits seal on account of the patent situation. He thought he was paying a premium for it.

Q. I show you what appears to be a letter marked Defendant's Exhibit Y, for identification from the B. F. Goodrich Rubber Company to G. L. Tarbox, Spicer Manufacturing Corporation. Do you recognize that signature at the bottom?

A. That is my signature.

Q. Do you remember anything about the results of your research division on Koroseal, etc., at that time?

A. This is merely an effort to identify Koroseal positively in the factory by giving it a black color. The original Koroseal material is rather light, transparent, but working in molds in the factory you get discoloration sometimes. Some would be darker than others. Tarbox objected to the discoloration. So we decided to add a little carbon in it and naturally make it black.

Q. I show you a copy of a letter which I understand is from the same source as before, the Goodrich Rubber Company, to the Spicer Manufacturing

(Deposition of Fred L. Haushalter.)

Company, dated June 18th, 1934, directed to the attention of F. L. Haushalter. Do you have any recollection of the oil seal made of the Koroseal sent to you by Spicer at that time? [14]

A. Koroseal is a material which is a basic material mixed with a plasticizer and that plasticizer is removed gradually by contact with thin oil. And that was what was happening here, the thin section of the shaft, the oil in the shock absorber was extracting the plasticizer and stiffened the material.

Q. That was the Koroseal at that time, June 18th, 1934?

A. That is right.

Q. I show you Defendant's Exhibit AA for identification, which I understand is from the same source as before, a letter dated August 20th, 1934, to the B. F. Goodrich Rubber Company from the Spicer Manufacturing Corporation, to your attention. Did you personally know anything about making these tests?

A. The Spicer was making Houdaille shock absorbers for Ford at that time under Houdaille license. In that shock absorber was a sealing member and I suggested to Tarbox that possibly they could work Koroseal out for that application, too, to increase the volume on seals, and he gave me opportunity to send samples for tests in the Houdaille type.

Q. Do you remember distinctly what became of those tests?

(Deposition of Fred L. Haushalter.)

A. Yes. Tarbox installed them in cars around Denver in the wintertime and the damn things leaked. The material is stiff enough at low temperature.

Q. I show you another letter dated January 18th, 1935, which the reporter has marked for identification, Defendant's Exhibit BB. It appears to be a letter from the Goodrich [15] Company to Tarbox, Spicer Manufacturing Corporation. Can you identify the signature on that letter?

A. Yes, that is my signature. While this 3RT-17 is a different Koroseal than the 3RT-14 that we originally started with, we were doing compounding work on the Koroseal to overcome some of the difficulties with the extraction of the plasticizer by oil.

Q. Do you remember what the result on the material was; what changes were made in its composition?

A. I would not swear that the 3RT-17 was finally adopted, but we did improve on the original Koroseal that was submitted.

Q. I show you another letter marked for identification as Defendant's Exhibit CC, dated January 29th, 1935, from the Goodrich Company to Tarbox, Spicer Manufacturing Corporation. Can you identify the signature upon that?

A. That is my signature. Tarbox tested the Houdaille seals both in hot climate and cold climate. I referred previously to the tests in Denver.

Q. Did you have anything to do with those tests?

A. I made the seals for it and he followed the tests.

(Deposition of Fred L. Haushalter.)

I show you a copy of a letter which I understand is from the same source as before, marked for identification as Defendant's Exhibit DD, dated January 30th, 1935, from the Spicer Manufacturing Company to Goodrich Company, attention F. S. Haushalter. Will you tell us what the SK-17198 parts made by you of Koroseal were?

A. That was molded and material we made for the [16] Houdaille shock absorber.

Q. From the same source as before, I show you a copy of a letter marked Defendant's Exhibit EE, marked for identification, dated February 20th, 1933, from Spicer Manufacturing Company to the Goodrich Company, Attention Haushalter. Do you recall anything of your own knowledge respecting that?

A. When we started molding that sealing material, unless we got a sharp edge and a lip at the end, Tarbox would run into leakage and the first one I remember that was molded, he used to cut the lip off with the lathe to get a sharp edge. Then the edge on the molded type was not as sharp as they should be, and he ran into leakage, and that is why he was kicking here.

Q. What was done about that, if you know?

A. We actually set up to cut that lip off after they were molded just to be sure that the edge was sharp.

Q. Mr. Haushalter, with respect to these synthetics that you were using back in 1933 and 1934, has there been any change in them since that time?

(Deposition of Fred L. Haushalter.)

A. Well, the basic material is the same. The difference comes in compounding. We might be interested to overcome that certain difficulty in application. In other words, changing this ingredient or that ingredient, you can change the flexibility or hardness, also.

Q. What about heat resistance?

A. Well, on Koroseal that would not apply because that is not a heat resisting material. It is a thermo [17] plastic. But Duprene which was later called Neoprene was effected by compounding ingredients being introduced.

Q. What was the temperature effects of thermo changes?

A. I might demonstrate by one example. When we first started with Duprene we had trouble with shrinkage, other material causing leakage. Then we discovered that by shrinking the material before it was cured in a heated chamber, then molding it, we would very much overcome that shrinkage difficulty and that made possible the use of Duprene on a great number of seals on this particular job.

Q. I show you Defendant's Exhibit D in this case, an oil seal. Are you familiar with oil seals of that character?

A. Yes. I recognize this molded sealing material as Koroseal made by Goodrich.

Q. Do you recognize the rest of this structure?

A. Also this bronze ring extended into it as being one of the rings that Mr. Gits gave us.

Q. During what time?

(Deposition of Fred L. Haushalter.)

A. I would say along the middle of 1933, in which this work was done.

Q. I will ask you the same in respect to Defendant's Exhibit E. That is not cut open.

A. The sealing material here is also Koroseal made by Goodrich, incorporated into a seal which I recognize as one that Mr. Gits made.

Q. Just one more, Mr. Haushalter, Defendant's Exhibit M. It has three different things upon it. Do you [18] recognize any of them?

A. These three pieces were molded by Goodrich under my direction, incorporating the brass ring that Gits provided. I can identify two of these definitely as Koroseal. I don't exactly identify the third one.

Q. The third one that you point to is the black one? A. Yes.

Q. In the other two, the brown ones?

A. Are definitely Koroseal.

Q. You say the ring is molded right into rubber-like material?

A. That is right, in the mold.

Mr. Haight: That is all.

Cross-Examination

By Mr. Owen:

Q. Mr. Haushalter, no production order was ever received from Gits or Spicer for the Koroseal sealing member such as shown in Exhibits D and E, were they?

(Deposition of Fred L. Haushalter.)

A. This Exhibit D apparently is incomplete. It has no ring in there.

Q. That was not my question. No production order was ever received by Goodrich from either Gits or Spicer to make for production quantities correspond to the sealing member shown in Exhibits D or E?

A. What would you call a production order?

Q. In large quantities?

A. We had orders for several thousand seals from Gits.

Q. Do you have any records of those orders?

A. I have none with me. [19]

Q. Do you know the dates of those orders?

A. I could not swear to the dates.

Mr. Owens: That is all.

(Witness excused.)

Deposition of G. L. Tarbox, taken at the same time and place and under the same stipulation herein before referred to:

G. L. TARBOX

of lawful age, being by me first duly cautioned and sworn as hereinafter certified, deposes and says as follows:

Direct Examination

By Mr. Haight:

Q. Will you give us your full name, please?

A. G. L. Tarbox.

(Deposition of G. L. Tarbox.)

Q. Where do you reside?

A. Todelo, 1428 Sabra Road.

Q. What is your occupation, Mr. Tarbox?

A. Experimental Research Engineer for the Spicer Manufacturing Corporation.

Q. Whose office are we sitting in, taking this deposition? A. My office.

Q. In the plant of what corporation? [20]

A. Spicer Corporation.

Q. How long have you been with the Spicer Manufacturing Company?

A. Since 1919, in November.

Q. How long in your present capacity?

A. Since 1920.

Q. Are you acquainted with Mr. Haushalter who was once connected with the B. F. Goodrich Rubber Company, who just testified? A. Yes.

Q. Do you know Mr. R. J. Gits of Gits Brothers Manufacturing Company, of Chicago?

A. What is the old man's initials?

Q. R. J. Gits, Gitz Manufacturing Company.

A. That is the elderly gentleman?

Q. That is right.

A. Yes. I have known him for years, both he and Mr. Haushalter, before shock absorber questions ever come up,—on other jobs.

Q. Did your company at one time manufacture a shock absorber in connection with which you endeavored to get an oil seal? A. Yes

Q. When did you first manufacture that shock absorber?

(Deposition of G. L. Tarbox.)

A. I would have to look back in the records to tell you just what date.

Q. Well, we will get to it just very shortly. For what concern or concerns were these shock absorbers made? [21]

A. I think our first customer was Hudson and Graham-Paige. I am pretty sure they were the first customers.

Q. Later did you manufacture for other automobile concerns?

A. I am not so sure about that. We made samples for practically all of the different automobile concerns.

Q. We have before you, Mr. Tarbox, a great number of exhibits. Those exhibits run from Defendant's Exhibit O, to Defendant's Exhibit EE. They comprise drawings and copies of letters. Now those are all before you. Do you know where they came from, these particular documents; as you go through that assemblage of documents, you will find some, as for instance, the one now before you, copy of letter July 15th, 1933, that have no identification mark upon them. That is because we have already identified on the record some of these copies. They are identified as Defendant's Exhibit J, but I wish you would examine all of those, too, so when you have done that we will have an answer in respect to all of the exhibits so identified and those included in Defendant's Exhibit J.

(Deposition of G. L. Tarbox.)

Mr. Owen: Before the witness answers, may I ask Mr. Haight, in your question you state a group of letters and drawings. You meant just letters?

A. There are no drawings in this group.

Q. I exclude drawings, I mean letters and copies of letters. [22]

A. These I think came out of my files.

Q. Where is that file kept?

A. In this office.

Q. Is it in this room now? A. It is.

Q. Is it a part of those cabinets in the corner of the room? A. Yes.

Q. Since about the time you received each of them individually or sent originals and kept copies respectively, have they been in your possession in such file? A. They have.

Q. Were they received and filed by you and filed away in the regular course of business?

A. Yes.

Q. Are they a part of the records of the Spicer Manufacturing Corporation? A. They are.

Mr. Haight: I offer all of the letters referred to in the exhibits first identified, beginning with the examination of this witness in evidence.

Q. I now show you a drawing with some writing thereon. A copy of that has already been identified on the records as Defendant's Exhibit B. But unless Mr. Owens finds some reason for wanting the original, we are going to let it go with a copy of the record, but I am showing you the original. Are you familiar with that document? [23]

(Deposition of G. L. Tarbox.)

A. I am.

Q. Can you tell about when it was made?

A. The date that is on there, to the best of my knowledge.

Q. That is June 30th, 1933?

A. That is when I signed it.

Q. Do you recognize the handwriting appearing thereon? A. I do.

Q. Whose handwriting is it?

A. It is mine.

Q. When did you do that writing on this piece of paper?

A. 6/30/33, to the best of my knowledge.

Q. Do you have any recollection as to who made the drawing?

A. Mr. Gits, I think. I am not positive. I am quite sure Mr. Gits made it because Mr. Gits incorporated that in a seal similar to that.

Q. When you say similar to that, you refer to Defendant's Exhibit D, do you not?

A. Yes. It is not exactly like it, but similar to it.

Q. What is the difference?

A. The edge down at the point, or wiping edge.

Q. That is, the small end of this synthetic rubber member?

A. Yes, sir, the small end. [24]

Q. That is different in what respect?

A. Mr. Gits originally had a washer held here like this. Got a piece of paper?

Q. Yes sir.

(Deposition of G. L. Tarbox.)

A. (Witness draws) The sealing member came down like that. That pressed up against that lip and kept it against the piston rod. That is the difference. That is what this point was for. Later on some time during the experiment, he put a coil spring on it.

Mr. Owen: By "this point" the witness pointed to the seal.

A. Right at the end of the lip.

Q. Will you mark this Defendant's Exhibit FF. I am showing you the drawing you just made. It is Exhibit FF for identification. Will you mark the part that you said was a washer that was first made?

A. You mean this?

Q. Yes. Just write "washer." (Witness complies.) Where is the sealing lip?

A. (Witness writes.) We were formerly using a leather seal on that same construction but the oil would go through the leather.

Q. When this drawing was made and this writing done upon Defendant's Exhibit B, who was present, if anybody, besides yourself?

A. That I can't remember. That is too far back. I can't remember.

Q. By that record that you made, according to it, [25] it was Gits and Haushalter, is that right?

A. Yes.

Q. Now, do you remember the occasion of your meeting; how it came about?

A. No. It was too far back. We were all interested in solving this problem with Koroseal and

(Deposition of G. L. Tarbox.)

it was my idea to get Mr. Gits to incorporate Koro-seal in it because the leather let oil go through it.

Q. But ever since this memo was made up on this drawing, you have had it in your possession?

A. It has been in my possession.

Q. Now there is another drawing I wish to show to Mr. Tarbox.

Mr. Owen: I have no objection to the photostat being shown of the original drawing.

Mr. Haight: Thank you very much. We will follow Mr. Owen's suggestion.

Q. Just for the record, we had a drawing yesterday that we did not prove, marked for identification Defendant's Exhibit K, which seems to be a photostat. I am now showing you one of the papers of your files here upon which a drawing appears which seems to be the same paper of which this is a photostat. Can you tell us whether it is or not?

A. It is a photostat of this.

Q. This paper marked Defendant's Exhibit K is a photostat of the original that is now before you?

A. That is right. [26]

Q. Well, we will look at the original. There is a drawing upon that document. Do you know who made that?

A. I did.

Q. There is some writing and some of it with lead lines connected with the drawing. Who made that?

A. I did.

Q. Underneath that are some entries, the first one of which—whose writing is that?

A. That is my writing.

(Deposition of G. L. Tarbox.)

Q. All the way down? A. It is.

Q. And your signature at the bottom?

A. It is.

Q. I notice in that writing the following: "See their letters of 7/19/35 and 7/25/35." July 19, 1935, is a letter that appears in Defendant's Exhibit J. Do you recognize the signature at the bottom of that? A. Mr. Gits' signature.

Q. Is that the letter referred to in your memo upon Defendant's Exhibit K?

A. It apparently is.

Q. I will turn to another letter dated July 25th, 1935. Can you tell us whether or not that is the letter referred to in your memo appearing upon Defendant's Exhibit K?

A. To the best of my knowledge, it is.

Q. I notice upon the letter of July 25th, 1935, from Gits Brothers Manufacturing Company to the Spicer Manufacturing Company, some entries in pencil. Are you familiar with those? [27]

A. Yes sir.

Q. Do you know who made them?

A. I did.

Q. Will you read them?

A. "Seals received 7/26/35. Put four on test, 7/29/35. Run okeh."

Q. From whom was the seals received?

A. From Gits. That is the seal with the coil spring around the bottom.

Q. Yes.

A. It has no reference to the other drawing.

(Deposition of G. L. Tarbox.)

Q. What was the occasion, if you recall, for your making this drawing appearing on Defendant's Exhibit K?

A. As a rule we got new types of seal showing new construction. We made a sketch for the record.

Q. What did you make this sketch from?

A. I sectioned a seal and made this sketch from what I saw.

Mr. Haight: I shall offer in evidence Defendant's Exhibit FF and Defendant's Exhibit K, and the one we did not offer yesterday because I wanted to get some more testimony, Defendant's Exhibit B.

Q. I wonder, Mr. Tarbox, if you are familiar with the structure illustrated in Defendant's Exhibit H?

A. Yes. [28]

Q. You notice the legend, "Proposed method of tensioning No. 85 oil seal"?

A. Yes.

Q. What, if anything, do you remember about that test?

A. I remember we tested some of those seals.

Q. Have you any record of that test?

A. No. The seal was not successful. We would not bother with it.

Q. What was wrong?

A. This wiper which would not wipe the oil off of the piston rod. The contact must be down at the point. That was the failure.

Q. Are you familiar with this document that I now place before you which we will identify later if you are familiar with it?

A. Yes, I am familiar with that.

(Deposition of G. L. Tarbox.)

Q. Do you know who made those entries?

A. I did.

Q. When did you make them?

A. There is the date.

Q. January 26th, 1934? A. Yes.

Q. What do those entries relate to?

A. They relate to tests on shock absorber seals.

Q. Did you make those tests?

A. Yes, sir, I did.

Q. I noticed that they refer to No. 85. Was that the oil seal, No. 85, shown in this drawing, Defendant's Exhibit H? [29]

A. Yes, I am sure it was.

Q. You made the entries at the time that you made the tests? A. Yes.

Q. And made them accurately?

A. To the best of my knowledge.

Q. What are those entries?

A. To what do you refer?

Q. I want you to read them.

A. One No. 85 Triakall Red. Red was an identification put on there by Mr. Gits, I think, just a dab of paint put on it; left 28,649,000. Ran 4,418,000 strokes. Rod slightly wet. Run 5,600,000 strokes okeh. A lighter spring should be used on the shaft of soft materials. 3½ spring standard washer No. 85 Thiakall hard put on at 28,649,000. Run 5,600,000 strokes okeh. Better than the soft.

(Deposition of G. L. Tarbox.)

Q. What is the next entry?

A. One pair each put on Emrich's car. See road records.

Q. Who is Emrich?

A. An employee of this company.

Q. Do you know where that record is?

A. I could not say for sure.

Q. What is the next entry?

A. One No. 85 Gits soft, 11½ pound spring put on. 3/10/34. Straight 4,000,000 strokes okeh.

Q. And the next one?

A. One No. 85 Gits hard, 3½ spring put on, 3/10/34. [30] Straight 4,000,000 strokes okeh.

Q. The okeh means what?

A. As far as these particular tests were concerned, we thought they were pretty good seals.

Q. When you refer to strokes, that is strokes of what?

A. Piston rod in the shock absorber.

Q. About what was the range of the movement?

A. On our regular test machine we run them 4 inch stroke.

Q. What was the size of the rod?

A. 7/16ths. I might say that No. 85, I don't think it always refers to that particular construction. I am not positive. Mr. Gits records might vary, I am not sure.

Mr. Haight: I do not think it is necessary to offer that. I had it read into the record. I think that will be enough.

(Deposition of G. L. Tarbox.)

Cross-Examination

By Mr. Owen:

Q. Mr. Tarbox, you were shown Exhibit B and asked to compare the sealing element shown there with the sealing element in Exhibit D, and you pointed out the little difference at the end of the sealing lip. You also found a difference in the flange which comes out along the radial part of the case. In the drawing Exhibit B, there is no such flange; that is correct, isn't it?

A. I don't know what you are driving at. You mean down here?

Q. No, along the radial wall of the case there is a flange molded on that sealing element that is not present. [31]

A. Is that molded over or pressed over by compression of this ring?

Q. Well, it looks to me like it was molded over.

A. I could not tell you whether it is one way or the other. It seems to me that the ring forced it over there. I am not sure.

Q. Will you examine Exhibit D a little more carefully and see the mold marks there and see whether that was molded there or pressed out?

A. That is difficult for me to say. I think he got melted material from Goodrich. I am positive.

Q. As assembled in Exhibit D, that sealing element differs from the sealing element shown in Exhibit B, doesn't it, in the shape it is in?

(Deposition of G. L. Tarbox.)

A. In the shape it is in, it is compressed, whether it was like that upper part of Exhibit B, before it was pressed, I don't know. May I offer a word there?

Q. Yes.

A. This seal (pointing to Exhibit D) was made, I think, at our request, because of the height of the shock absorber had to be brought down. We had to shorten the over-all length and with the construction used on the Exhibit B—that the washer necessitated——

Q. Is that like Plaintiff's Exhibit 1 that I am handing you?

A. It necessitated shortening the shock absorber because this had a washer and spring. It was so long. We wanted to cut the thing down short and it was a later effort to make a seal that was short, to do away with this construction [32] here with a washer and then a spring which necessitated the thing being about an inch long over all when it should be about a half inch.

Q. To clear up that answer, the later form made up by Mr. Gits was Exhibit D? A. Yes.

Q. And the earlier form was the one used in the sketch a while ago and was somewhat like Plaintiff's Exhibit 1 except it had a compression washer and a sealing lip on the shaft.

A. Yes, and a spring below it to hold the seal up.

Q. Do you recognize Plaintiff's Exhibit 1 as a seal that you ever used here at Spicer?

(Deposition of G. L. Tarbox.)

A. It is very much like the original samples Mr. Gits sent in before he got to using seal instead of numbers. We used that identical design for a long time.

Q. And the seals like Defendant's Exhibit D never got beyond the sample stage; you never ordered those in quantities?

A. No. We never did. The final test on them showed they were not satisfactory.

Mr. Owen: That is all.

Mr. Haight: Are the signatures of Mr. Haushalter and Mr. Tarbox waived in this deposition?

Mr. Owen: Yes.

Mr. Haight: In regard to Exhibit I, there are two witnesses, their names [33] appearing thereon as Frank Zeman and M. A. Russell. I am asking if you are perfectly willing to stipulate on account on the inconvenience in getting them, that if they were called to the stand, they would testify that they signed their respective names on that drawing on the date it bears, April 16th, 1934?

Mr. Owen: It is so stipulated.

[Endorsed]: Filed U.S.D.C. Jan. 11, 1946.

[Endorsed]: Filed U.S.C.C.A. May 21, 1947.

In the District Court of the United States for the
Northern District of California, Southern
Division

Civil Action No. 23697G

SUIT FOR INFRINGEMENT OF
LETTERS PATENT No. 2,146,677

NATIONAL MOTOR BEARING CO., INC.,
a corporation,

Plaintiff,

vs.

CHANSLOR & LYON CO., a corporation,
Defendant.

The Depositions of HAROLD H. KLEIN, HUGH
T. STEWART, on behalf of Plaintiff, and
STANLEY C. BATTY, on behalf of Defendant,
taken pursuant to Order of Court and
Agreement at Chicago, Illinois, on June 7th,
A.D. 1946, before Claude W. Youker, Jr.,
Notary Public.

HAROLD H. KLEIN

Direct Examination

By Mr. Owen:

Q. Mr. Klein, what is your full name and address?

A. Harold H. Klein, 1026 Fisher Building, Detroit 2, Michigan. [4*]

Q. What is your age? A. Forty-nine.

Q. By whom are you employed?

A. National Motor Bearing Company.

Q. For how long have you worked for National?

A. Since 1945.

Q. When did you come to Detroit?

A. 1936, February.

Q. And have you been there substantially continuously since that time? A. That is true.

Q. In which National plant did you work before you went to Detroit? A. The Oakland.

Q. Oakland, California? A. Yes.

Q. Which plant was that?

A. That was the 1100 78th Avenue Plant.

Q. That was the main plant? A. Yes.

Q. The main plant at Oakland, California?

A. Yes.

Q. What work did you do when you were with National?

A. Experimental research and development work. [5]

Q. What is your present work?

A. Field engineer, field sales engineer for National.

(Deposition of Harold H. Klein.)

Q. How long have you been doing that?

A. Since coming to Detroit.

Q. I show you two devices which are tagged as Exhibits in this case, as Exhibits 21 and 22 and ask you if you have ever seen those devices before?

A. Yes. I have seen them. I made them.

Q. What are they?

A. Oil seals. I made them in our plant in Oakland.

Q. Do you remember when?

A. In our research laboratory.

Q. Do you remember when?

A. Yes. The dates are right on here, on the tags I put on. 9/20 on No. 22, and 9/4 on 21.

Q. What year? A. '35.

Q. 1935? A. Right.

Q. You say they were tags that you put on. How do you know you put those tags on?

A. Well, at the conclusion of the test the seals were tagged and turned over to Mr. Lloyd Johnson to be placed in his safe. [6]

Q. You have in your hand now Exhibit 21, is that correct? A. That is right.

Q. The small tag attached to that has some writing on it. Is that your handwriting?

A. It is in my handwriting.

Q. Do you remember what date you wrote that on there? A. Yes. 10/7/35.

Q. Does that date have any significance?

A. In what respect?

Q. Well, what happened on that date, 10/7/35?

(Deposition of Harold H. Klein.)

A. Well, the test was concluded and it was turned over to Mr. Johnson.

Q. How long did that test run?

A. A month. A little over a month.

Q. Do you know the date it started?

A. Yes. 9/4/35.

Q. Do you know the result of that test?

A. Very satisfactory.

Q. What report did you give to Mr. Johnson on that test?

A. I gave Mr. Johnson the same report and submitted the written report along with it. [7]

Q. What kind of a test did you give that seal?

A. In a fixture that simulates actual applications, a test fixture.

Q. Of what does it consist?

A. It consists of a head and a body that contains oil, a rotary shaft the speed of which can be varied to suit testing requirements, and we also had means of raising and lowering the oil temperature with the use of steam, and the application of pressure if we required it.

Q. What would you say with regard to the tests that were given this Exhibit 21? Were they tests simulating the usual conditions of the operation of a seal?

A. That is right. They were the regular tests that we would give for a seal about that size for general use.

Q. I hand you a blueprint which is marked as an exhibit in this case, No. 20, and ask you if you have ever seen that before?

(Deposition of Harold H. Klein.)

A. Yes. I made this sketch. Originally it was made to start molds to make samples.

Q. What is the date of that sketch?

A. 5/25/35. [8]

Q. In whose handwriting is that?

A. That is my handwriting.

Q. Who made the sketch? A. I made it.

Q. Of the cross-section of the seal?

A. I made it.

Q. Is the other information on there in your handwriting? A. That is right.

Q. And is that cross-section of the seal substantially the cross-section of the seal of Exhibits 21 and 22? A. That is correct.

Q. I notice a statement on there at the bottom which reads:

“First installed in machine, 9/4/35.”

Does that date agree with any date on any of the tags on these seals?

A. Yes. That agrees with the tag on seal 21.

Q. You mean, Exhibit 21? A. Exhibit 21.

Q. And that was the test that was concluded on 10/7/35? A. That is correct. [9]

Q. I notice a statement on Exhibit 20, this sketch, which says:

“First seal of this type made 9/28/35.”

A. That is an apparent error on my part. That should have registered August, because the seal was actually tested on 9/4. That is, the start of the test was at 9/4 and the conclusion was at 10/7. That should have been registered as August, that “9/28.”

(Deposition of Harold H. Klein.)

Q. In other words, the "9" should have been "8"? A. That is correct.

Q. Is that right? A. That is right.

Q. Have you anything else here in the exhibits of this case to confirm your statement that this seal was made in August?

A. Yes. The regular shop drawings that were made from my sketches indicate that molds were made on 8/13.

Q. 8/13—what? A. 8/13/35.

Q. You are referring now to a group of four prints which are marked——

A. There was an assembly print, I should say.

Q. You are referring to a group of four prints which are marked Exhibit 23?

A. That is right. There was an assembly print, 8/13/35. There was an actual mold print, 8/21/35, and—well, the male and female are both 8/21/35. The details of the case are both 8/13.

Q. Having in mind this date on Exhibit 20 of 8/28/35, which you say is the correct date, does that allow enough time for the mold to have been made to have molded these samples?

A. Yes, definitely.

Q. Do you remember doing it?

A. Yes. I remember the process of making these molds and the actual process of making seals and testing them.

Q. How about the actual making of the seal?

A. I did myself, as far as the molding of the

(Deposition of Harold H. Klein.)

material to the case is concerned. The cases were spun up and prepared under my supervision.

Q. When you took these seals Exhibits 21 and 22 out of the mold, did you do anything to them?

A. Yes. When we took them out of the mold it was necessary to trim a little flash off around the periphery of the case. [11]

That was done by a buffing process, by holding the seal up against a buffing wheel which brought the back side of the sealing element within the case.

Q. Do you remember doing that to Exhibits 21 and 22? A. Yes, I do.

Q. Look at Exhibits 21 and 22 now.

A. Yes.

Q. Are they in the same shape now they were in when you made them and tested them?

A. No, they are not.

Q. What has changed on them?

A. Well, there is a slight raising of the element.

Q. What element?

A. Of the sealing element. That is due to aging and cold flow.

Q. When you say a slight raising of the sealing element, are you referring to the radial face on the back of the sealing member?

A. The radial face on the back of the sealing member is distorted from age and from yielding to the pressure of the spring and the natural cold flow tendencies of the material under such pressure, or [12] any pressures as a matter of fact.

(Deposition of Harold H. Klein.)

Q. When you molded up these seals was any cement applied to the metal before the mold was closed? A. Yes, there was.

Q. Whereabouts was it applied?

A. To the surface of the metal where the rubber would contact.

Q. At the end of the bonding operation was the sealing element cemented as well as bonded to the case?

A. Yes. That was the object in the manufacture of the seal.

Q. Is that still true today with Exhibit 22?

A. Yes. There is a little variation—in some places it seems to be a little loose—but that is the general condition.

Q. What material did you say you used, or did you say? A. We used Thiokol.

Q. When was it you last saw Exhibits 21 and 22 until I showed them to you last night at the Palmer House? A. About ten years ago.

Q. About ten years ago? A. Yes. [13]

Q. And your testimony is that they are not now in the same condition that they were then?

A. That is correct.

Mr. Owen: You may cross-examine, Mr. Haight.

Cross-Examination

By Mr. George I. Haight:

Q. Will you look at Plaintiff's Exhibit 23?

Mr. Owen: 23?

Mr. George I. Haight: Yes.

(Deposition of Harold H. Klein.)

Mr. Owen: That is the four prints.

Q. (By Mr. George I. Haight) (Continued): Plaintiff's Exhibit 23 is made up of four prints of drawings numbered respectively Exhibits 314, 315, 316 and 317. That is correct, is it not?

A. Yes. That is correct.

Q. Will you look at 316 of Exhibit 23.

A. Yes.

Q. That is entitled "Mold Bottom," is it not?

A. That is correct.

Q. 315 is entitled "Mold Top," is it not?

A. That is right.

Q. You said you made those molds as I understood you; is that correct?

A. They were made under my supervision.

Q. Of what were they made? A. Steel.

Q. Now, the material you used to fill that mold was what? A. Thiokol.

Q. Which Thiokol?

A. It was a granular form.

Q. Was it Thiokol "A"? A. Yes.

Q. Had you ever had any experience with Thiokol "A" prior to that time? A. No.

Q. Where did you procure it?

A. What did you say?

A. Where did you procure it?

A. We procured it from the manufacturer.

Q. Did anybody tell you to use that Thiokol "A"?

A. Well, it was presented to me by the management.

Q. By whom?

(Deposition of Harold H. Klein.)

A. Mr. Johnson was the one—Lloyd Johnson was the one who was looking up these materials we were using for our research work at that time.

Q. Did he tell you at that time to use Duprene?

A. Did he tell me at that time?

Q. Yes. A. No.

Q. Did he tell you at that time that Duprene was preferable?

A. I do not recall him making such a statement.

Q. Did you try any other material——

A. Yes.

Q. ——than Thiokol “A”?

A. Yes, we did.

Q. What other materials did you try?

A. Duprene.

Q. Any others in addition to Duprene?

A. No.

Q. But after trying Thiokol “A” and Duprene, the Thiokol “A” was chosen, is that right?

A. The Thiokol “A” blended itself to our particular facilities and that was the material that was chosen.

Q. Now, I wish you would describe in detail the method that you used in filling the mold, in making these oil seals. Was it the same in respect to Exhibits—what are they?

Mr. Owen: 21 and 22.

Q. (By Mr. George I. Haight) (Continued): Was it the same in respect to Exhibits 21 and 22?

A. Yes. The contour, you mean, of the mold?

(Deposition of Harold H. Klein.)

Q. Was the method that you used in making the seal, Plaintiff's Exhibit 21, the same identical method as that you used in making the seal, Plaintiff's Exhibit 22? A. Yes.

Q. Will you describe in detail what you did, starting with the mold.

A. Well, the mold was placed in the press, of course after being filled—it is a bulk factor mold—after being filled to the proper factor. After the case was put in the upper half of the mold was applied and put in the press under heat and pressure and cured.

Q. Did you put anything in the mold before you put the Thiokol "A" in the mold? A. Yes.

Q. What did you put in?

A. We used a substance on the mold to keep the rubber from adhering.

Q. But was there any article that you put in the mold in addition to the Thiokol "A"?

A. Oh, certainly. The case.

Q. Is that represented in these drawings to which your attention has just been called?

A. That is right.

Q. How did you place that in the mold?

A. Well, by dropping it into its proper position.

Q. When you dropped it into its proper position did it assume the position illustrated in Exhibit 316 of Plaintiff's Exhibit 23, the drawing which you have before you?

A. 314 is the drawing that shows the position of the case in the sealing element. Is that what you mean to refer to?

(Deposition of Harold H. Klein.)

Q. No. I am referring to 316. That shows the mold bottom with a structure mounted therein.

A. I do not see any structure in it at all.

Q. Well, did you put that structure in the mold?

A. Certainly. It had to be in there to be molded into the material.

Q. Then when did you put this cement on?

A. The cement was placed on before the case was placed in the mold.

Q. What was the cement?

A. It was some sort of—we used several different kinds, plibond, and one thing or another.

Q. Did you use several different kinds on this particular one?

A. No. I cannot tell you exactly what bond we used on this.

Q. Well, tell us which one of the many it might have been?

A. It might have been plibond.

Q. It might have been what?

A. Plibond.

Q. What else?

A. I do not know just what other cements we had, but we had a number of commercial rubber cements at that time that we were trying, but I cannot tell you which one was on this.

Q. To what thickness did you put it on?

A. It was just spread on with a brush.

Q. Did you treat it after you put it on?

A. The case was degreased and then the material, the cement material, was applied.

(Deposition of Harold H. Klein.)

Q. Did you apply it to all parts of the cup that you placed in the mold?

A. No. Just to the part where the adhesion was to take place.

Q. What part was that?

A. The part where the anchor holes have been provided.

Q. How many anchor holes were there?

A. Well, we used numerous anchor holes. I cannot tell you how many were in this particular one. Sometimes we used more than the print showed.

Q. Do you remember the dimensions of the anchor holes?

A. I do not remember, no. They were one-sixteenth, or a little better, in diameter.

Q. Will you look at Exhibit 317 which is one of the drawings of Plaintiff's Exhibit 23, and see if that helps you?

A. Yes. That looks substantially as it should have been.

Q. What does the legend "8 one-sixteenth holes" mean?

A. Well, as this thing was drawn up there were supposed to be eight sixteenth-inch holes. I remember, however, in making some of these samples that we increased the number of holes. Whether there are eight in this or not, I cannot tell you.

Q. After you had placed the cup in the bottom of the mold, what did you do next?

(Deposition of Harold H. Klein.)

A. We inserted the granular material and the next part of the operation was to place the upper half on for the curing.

Q. This granular material—was it of coarse granules or fine granules?

A. No. It was very finely ground granular material. It flowed very easily.

Q. About how fine was it?

A. Well, I do not know exactly at this time how fine it would average, but I would say it was a thirty-second to a sixteenth of an inch, irregularly shaped.

Q. To what extent did you fill the mold bottom illustrated on Exhibit 316 of Plaintiff's Exhibit No. 23?

A. To what extent did we fill it?

Q. Yes.

A. To the extent that the manufacturer recommended as a bulk factor which was, as I recall it, about two and a half to one, or something of that nature.

Q. When the mold was filled with this Thiokol "A" material, how far up above the face of the mold did it extend?

A. Well, that would be about two and a half times the ultimate thickness of the lip itself.

Q. That would be how high?

A. Well, it would probably be—this is a guess, now, as far as the actual height of the material is concerned, but it would probably be three-quarters of an inch, five-eighths or three-quarters of an inch.

Q. Above the upper face that we see?

A. Yes.

(Deposition of Harold H. Klein.)

Q. Around the outer circumference of the mold?

A. I would say it was about—somewhere between nine-sixteenths and eleven-sixteenths. I, of course, do not remember that detail too clearly.

Q. What did you next do?

A. The next operation was to apply the pressure gradually to allow the material to flow completely around the case, and after the two molds were in their ultimate position, the heat was applied for curing.

Q. Did the pressure come from the descent of the mold top illustrated in Exhibit 315 of Plaintiff's Exhibit 23?

A. That is right.

Q. How far down did you bring the mold top in relation to the mold bottom?

A. The mold came together, as far as the two faces.

Q. Did any of the Thiokol "A" material extrude between the mold bottom and the mold top?

A. No. We did not have that much flash. We figured it closer than that.

Q. There was some flash, was there?

A. Very slight flash around the o.d. of the case as it came out.

Q. But you were assured that the mold was filled with the Thiokol "A" material after you had applied the pressure?

A. Yes.

Q. Is that correct?

A. That is right.

Q. What did you next do?

A. We cured them for about four minutes.

Q. What do you mean by that?

(Deposition of Harold H. Klein.)

A. Retained the assembly under heat and pressure.

Q. How did you apply the heat?

A. Steam.

Q. To what heat did you bring the contents of the mold?

A. It is quite a long while ago to remember exactly.

Q. Do you remember at all?

A. Yes. I think it was somewhere around 250; in that neighborhood.

Q. 250 degrees Fahrenheit? A. Yes.

Q. And you held it at 250 degrees Fahrenheit for about four minutes? A. Yes.

Q. How did you apply the steam?

A. Well, it was a steam platen, upper and lower steam platen.

Q. Did you apply it to the entire mold in its assembled position? A. That is right.

Q. After you had applied the heat for about four minutes, what did you next do?

A. Then we removed the assembly, and removed the completed seal.

Q. And you did that immediately after separating the mold bottom from the mold top?

A. Well, after cooling it sufficiently to handle it.

Q. To what extent did you cool it?

A. Sometimes we dipped it in water and other times we just allowed it to cool until it could be comfortably handled.

Q. At about what temperature was it, do you know?

(Deposition of Harold H. Klein.)

A. You mean, when we went to handle it?

Q. Yes. A. No, I do not.

Q. You say "sometimes." Do you remember what you did in respect to Plaintiff's Exhibit 21?

A. No.

Q. Do you remember what you did in respect to Exhibit 22? A. No, I do not.

Q. Then you took them out, but they were cooled to the extent so that you could handle them, is that right? A. No.

Q. What is the fact?

A. I said that I handled them and removed them after they could be handled, after they were cool enough to be handled.

Q. You cannot tell us about what temperature that was? A. No.

Q. You were doing experimental work at that time? A. Yes, I was.

Q. Did you think that was of no importance?

A. Yes, I did.

Q. You thought it was of no importance?

A. Yes.

Q. Is that right? A. That is right.

Q. Now, what did you next do with these exhibits, Plaintiff's Exhibits 21 and 22?

A. They were tested in our regular testing heads.

Q. Were they both tested?

A. No. Just one.

Q. You remember that, do you?

A. That is right. Just one was tested.

Q. Do you have any memo on it?

(Deposition of Harold H. Klein.)

A. There was a report, as the tag states there, but it seems as though shortly after those were made I was called East to take the place of one of our field engineers and our laboratory was moved, and in the move I lost some instruments that could not be located and also some of the reports I had left when I left hurriedly.

Q. Had you ever at any time furnished those reports to Mr. Johnson?

A. Yes. He has read various reports—that is, not this one, but it was customary for me to submit reports to Mr. Johnson.

Q. But you did not submit the report in regard to Plaintiff's Exhibits 21 and 22, is that the fact?

A. That, I believe, is the fact, because right after I made these tests I had to leave, and the thing did not go through the usual routine of getting them into the records.

Q. Now, will you look at Plaintiff's Exhibit 23, the drawing, and Exhibit 314 thereof?

A. Yes.

Q. Did you make the drawing of which this is a print? A. No.

Q. Who did make it?

A. You mean, did I make the print?

Q. Did you make the drawing?

A. I made the drawing of which this is the print, yes.

Q. Did you make all four of these drawings that are comprised in Plaintiff's Exhibit 23?

A. Did I make these drawings?

Q. Yes.

(Deposition of Harold H. Klein.)

A. No. These were made in our drafting room. I made the original sketches from which these were made, if that is what you are driving at, and the original drawing from which the seal was made.

Q. Is this a blueprint of the sketch or is it a blueprint of a drawing made from a sketch?

A. This is a print made off of my sketch, my original sketch, of which I have a photostat here.

Q. You have a photostat of the original sketch?

A. Yes.

Q. May I see it, please? A. Yes.

Q. That is Plaintiff's Exhibit 20, is it?

A. That is right.

Q. Did you make that sketch before or after these tests to which you have referred?

A. Before.

Q. From what, if anything, did you make that sketch? A. From what?

Q. Yes.

A. From my own imagination.

Q. And this was a product of your imagination, was it? A. Exactly.

Q. Now, looking at that sketch, what is the cross-hatched material appearing in the figure?

A. You mean, the cross-sectional material?

Q. Yes.

A. Well, the upper, darker part, of course, was meant to be metal.

Q. Yes. A. And the bottom, rubber.

Q. What is the circular part?

A. That represents the spring.

(Deposition of Harold H. Klein.)

Q. How long before you made this sketch did you imagine that structure?

A. Well, in collaboration with Mr. Johnson, probably we talked about it on several different occasions. I would say it was probably over a period of thirty days.

Q. But you are the one who finally embodied it in this actual representation of the actual structure?

A. The what?

Q. This representation of the actual structure.

A. You mean, did I make the sketch?

Q. Yes. But that was a sketch of your imagination, you said?

A. That was in collaboration with Mr. Johnson. We worked together on these developments.

Q. He imagined too, did he?

A. He imagined too, yes.

Q. So you did this together?

A. That is right.

Q. Now, what is the relation of the outer face of the rubber material shown in sketch, Plaintiff's Exhibit 20, to the ridge of the cup?

A. What is the relationship?

Q. Yes.

A. You mean, to the back side or the front lip?

Q. To the ridge of the cup which appears at the right, on the northeast corner of the drawing.

A. What is the relationship?

Q. Yes.

A. Well, the back side of the sealing element is within the cup, the ridge of the cup.

(Deposition of Harold H. Klein.)

Q. Where was it in the structure that you made in the mold, Plaintiff's Exhibit 23, Exhibits 316 and 315?

A. That is the upper half of the mold you are speaking of?

Q. Yes, the upper half and the lower half.

A. It was within the structure of the cup.

Q. But it was upon the same plane as the cup bottom, was it not?

A. It was on the same plane, but we used a buffing wheel to remove a slight flash and to bring it within after the molding operation.

Q. Did you use a buffing wheel to remove anything other than the flash?

A. Well, the object was not to remove anything other than the protrusions of the face, to bring it within, and any little flash that may be there.

Q. So upon that structure, the sealing element, the Thiokol "A" material was on the same plane as the bottom of the cup, was it not? It could not be otherwise, could it?

A. What was the question, please?

Mr. George I. Haight: I will state it again.

Q. (By Mr. George I. Haight): The sealing element, to-wit the Thiokol material, was on the same plane as the bottom of the cup?

A. In the mold?

Q. Yes. A. Yes.

Q. And that is the way it stayed, is that not true?

A. No. As I told you, we used a buffing wheel

(Deposition of Harold H. Klein.)

the buff the slight flash that was on there and to bring the back side of this element within the cup after molding.

Q. How much?

A. Just so it was in the clear. Our object there was to be sure that if this seal were used under any conditions where a hub or any lateral—for instance, on an electric motor, where any lateral action of the shaft would bang it up against the hub, or the adjacent machinery, the sealing element would not be damaged. That is why we wanted to bring it at least within the outer case, or the edge of the case.

Q. Have you discussed that with anybody since the time you made these seals, Plaintiff's Exhibits 21 and 22?

A. Yes.

Q. With whom?

A. I talked with Mr. Owen about it.

Q. When?

A. Last night.

Q. Is that the first time?

A. The first time.

Q. From 1935 until last night you had never discussed it with anybody, is that right?

A. We discussed it when we talked about designs for production.

Q. Who discussed it?

A. We did.

Q. Who is "we?"

A. Well, that is, in our manufacturing processes.

Q. Who?

A. In the field, when we were contemplating supplying these to different customers.

(Deposition of Harold H. Klein.)

Q. Whom? You said "we talked." Tell me what you mean by "we."

A. Well, as a matter of discussion, with anybody [33] with whom we happened to be discussing the seal as a sealing element for a product.

Q. This was in the field?

A. In the field.

Q. Did you sell them to anybody?

A. No.

Q. But you discussed it with various people with the intent of selling them, is that the idea?

A. Yes, that is right.

Q. But nobody bought?

A. Well, we were not ready to go into manufacture, because we did not feel——

Q. Answer me. Nobody bought. That is true, is it not? A. Yes. That is true.

Mr. George I. Haight: All right.

Q. (By Mr. George I. Haight): Now, was that part of your imagination, to do that buffing?

A. That is right.

Q. To what extent did you depress the Thiokol "A" material in the buffing?

A. I never measured it, of course.

Q. Ten-thousandths? [34]

A. We did not depress it at all.

Mr. George I. Haight: That is what I thought.

Q. (By Mr. George I. Haight): Why didn't you say so in the first place?

A. What do you mean?

Q. That you did not depress it at all ?

(Deposition of Harold H. Klein.)

A. What do you mean? Why would I——

Q. I mean exactly what I say. Why didn't you say in the first place that you did not depress it at all? That is the fact, is it not? You did not depress it at all?

A. I do not understand what you are talking about.

Q. I am afraid you are taking refuge in that observation.

A. I am not taking refuge in anything. There was no compression when we buffed those seals.

Mr. George I. Haight: That is also just as I thought.

Mr. Owen: There is no contention otherwise, Mr. Haight.

Mr. George I. Haight: Oh, yes.

Mr. Owen: No. [35]

Mr. George I. Haight: The affidavit of one Mr. Owen contains a contention otherwise.

Mr. Owen: I beg to differ.

Mr. George I. Haight: If you have forgotten, I will read it to you.

Mr. Owen: I beg to differ.

Q. (By Mr. George I. Haight): Now, you have a distinct recollection now of having made a test of Plaintiff's Exhibit 21?

A. That is right.

Q. And you have not discussed it with anybody from that time up until last night, but you remember it very definitely at the present moment, do you not?

A. Yes. Why shouldn't I?

Q. What is there about Exhibit 21 that gives you that definite recollection?

(Deposition of Harold H. Klein.)

A. Well, I made it. That was my duty, and that is what I was employed for, to do that type of work. Why shouldn't I recollect it?

Q. I am asking you. A. O.K.

Q. Why do you recollect it? I will ask you that? [36]

A. I recollect it because I made it.

Q. And because it was a product of your own imagination, is that it? That impressed itself upon you, is that right?

A. It was a product of my imagination in conjunction with those with whom and for whom I was working.

Q. Well, now, who other than Mr. Johnson?

A. Mr. Johnson and myself collaborated closely on this.

Q. Who else among those others with whom you were working? A. That is all.

Q. How long did you test Plaintiff's Exhibit 21?

A. Thirty days. A little over a month.

Q. It ran continuously during that time?

A. That is right.

Q. Did you have anything adjacent it on the shaft on which you ran it?

A. Did I have anything adjacent it?

Q. Yes.

A. Sure. We had what we called a plug the right size and a hub. [37]

Q. Did you have any adjacent moving part?

A. No.

Q. When you tested it?

A. No. No adjacent moving part.

(Deposition of Harold H. Klein.)

Q. You did not test Plaintiff's Exhibit 22?

A. No.

Q. You are sure of that, are you?

A. Definitely.

Q. You have an independent recollection of that right now? A. Very definitely.

Q. Have you discussed that with anybody since 1935? A. No, I have not.

Q. You did not even discuss that last night, did you? A. No, I did not.

Q. When you saw Plaintiff's Exhibit 22 you at once recognized it? A. That is right.

Q. As one that you had made?

A. That is right.

Q. And you at once remembered that you had not tested it, is that correct? [38]

A. That is right.

Q. And you had not discussed that matter with anybody at any time over all of these years; that is correct, is it not?

A. I had no occasion to discuss it.

Q. I did not ask you that. I asked you if you did. A. O.K.

Q. And you did not? A. I did not.

Q. You said that these were to be put in Mr. Johnson's safe, is that right?

A. That is right.

Q. Do you know whether that was done or not?

A. I know it was done with this (indicating), but that was made for a sample for Mr. Owen.

(Deposition of Harold H. Klein.)

Q. When you say "done with this," what do you mean? What are you referring to?

A. This one (indicating) was placed in Mr. Johnson's safe.

Q. Which one is that?

A. That is No. 21.

Q. Did you know what was done with the other one? [39]

A. The other one was made for the express purpose of submitting it to Mr. Owen.

Q. Was that done? A. That was done.

Q. You remember that, do you?

A. I did not hand that to him. It was given to Mr. Johnson to give to him.

Q. Whether it was given to Mr. Owen or not, you do not know? A. No.

Mr. George I. Haight: All right.

Q. (By Mr. George I. Haight): Now, as you look at Plaintiff's Exhibit 22, how far out does the Thiokol "A" material extend beyond the plane at the bottom of the cup?

A. Well, it varies. I would say it protrudes ten or twelve thousandths in some places.

Q. How much?

A. About ten or twelve thousandths, maybe; in that neighborhood.

Q. Now, you have given the reason why that is extended, have you not, in your direct testimony?

A. I have given the reason that it has cold flowed, yes. [40]

Q. And what are the reasons?

(Deposition of Harold H. Klein.)

A. The material over a period of years has cold flowed due to aging and pressure exerted by the spring causing distortion.

Q. At the time that you made this was the ceiling element, the Thiokol "A" material, securely attached to the cup? A. That is right.

Q. And did it remain so during your test?

A. That is right.

Q. During your test of Plaintiff's Exhibit 21, to what temperatures would that material go?

A. Oh, the oil temperatures probably would run up to 195 or 200, I would say.

Q. Fahrenheit? A. Yes.

Q. Would that in anywise affect the Thiokol material, the Thiokol "A" material?

A. It did not make it leak.

Q. What?

A. It did not make it leak.

Q. Did it in anywise affect the material?

A. No.

Q. That heating did not change it in any regard, [41] in your opinion?

A. Not that we recorded.

Q. In your opinion did this cold flow affect the entire Thiokol "A" structure? A. Yes.

Q. When did you first become acquainted with Thiokol material?

A. When it was presented to me for use in this seal.

Q. You never had any experience with it before?

A. No.

(Deposition of Harold H. Klein.)

Q. What was your work before you went with the National Motor Bearing Company?

A. I was consulting engineer for the United States Fuel & Utilities Company, building a plant in Los Angeles, to make a smokeless fuel out of petroleum coke, or residium.

Q. What had been your education?

A. I served an engineering apprenticeship with a railroad and did some work in I. C. S. on mechanical engineering.

Q. Are you a chemist? A. No.

Q. Do you know of any other synthetic rubber [42] material that cold flows?

A. In our experience they all do, more or less.

Q. What about Duprene?

A. It has some cold flow.

Q. The use of Duprene would not solve the problem of cold flow then, would it?

A. Well, I am not a chemist. I certainly could not answer that one.

Q. But you can answer it when it comes to Thiokol "A," can you not?

A. Because I used it.

Q. Have you any other basis for what you have said except the fact that you used it in making these seals that you have been referring to, and that you now say are different from what they were before?

Have you any other basis of knowledge?

A. No, other than the fact that the Thiokol liter-

(Deposition of Harold H. Klein.)

ature indicates that cold flow is one of its characteristics.

Q. I understood you to say awhile ago you had Duprene, is that right?

A. Yes. We have tried Duprene, but there is no Duprene in this particular sample.

Q. How did you learn that there was cold flow [43] in Duprene?

A. Because we made seals out of it. We made other constructions besides this.

Q. Did you discuss with Mr. Johnson back in 1935 the matter of cold flow in Duprene?

A. No. As a matter of fact, I have no recollection of having any specific discussion with Mr. Johnson relative to the properties or cold flow of Duprene in that year.

Q. Tell me specifically why you did not use Duprene and used instead Thiokol "A."

A. I can tell you that, yes.

Q. Yes.

A. The reason is that our facilities lended themselves to the Thiokol material. As I understood it at that time, the Thiokol material had already undergone some sort of a precure that made it cure more rapidly.

Q. Now, will you look at Plaintiff's Exhibit again, the drawing, Exhibit 314. That shows the sealing element, does it not? A. 314, yes.

Q. And you say that over all these years that element has been affected by cold flow. What would [44] cold flow do to that element? Just tell us by looking at the drawing.

(Deposition of Harold H. Klein.)

A. You want me to describe what cold flow would do to that element?

Q. Yes.

A. The tension of the spring would pull the lip toward the shaft, or where the shaft would be, toward the center, and that in turn would make the material flow around a pivot point, namely the case pierce, and build up outside the case, build up in height outside of the case, and that is exactly what has happened.

Any description beyond that will have to be made by a chemist. That is my appraisal of the situation.

Q. How would it build up in the area—still looking at the drawing—between the metal cup element and the lower face as it appears in the drawing, of the sealing element?

A. The pressure of the spring and the cold flow action of the lip—it definitely shows that, if you would like to hold a scale across the face of the exhibit.

Q. You say that would affect that part of the [45] material that is adjacent the flange of the cup and between it and the bottom of the sealing element as it appears in Exhibit 314 of Plaintiff's Exhibit 23, is that right?

A. But definitely.

Q. Would there be cold flow on the other side of the flange, too?

A. Well, I will say that there is. Whether it has any compression or not, I do not know. A chemist will have to answer that.

(Deposition of Harold H. Klein.)

Q. Would there be cold flow if there had been no spring upon it? A. Yes.

Q. So, without the spring there would have been cold flow? A. That is correct.

Q. And would that cold flow occur at room temperature of the material?

A. I cannot answer that. You had better ask a chemist about that.

Q. Without the pressure of the spring due to cold flow would the Thiokol "A" material expand or would it shrink?

A. I cannot answer that one. I cannot answer [46] that one.

Q. The reason you cannot answer it is that you do not know, is that it? A. That is right.

Q. Do you know whether that material without any spring shrinks at all or not? A. No.

Q. Don't you know it would not shrink over one per cent?

A. Well, that was not my job, to know all the physical properties of that material at that time.

Q. Now, you said you had read the literature of the Thiokol Company.

A. That is right. We had to know something about the characteristics to see whether it was even remotely satisfactory to be used in an oil seal and we knew what we were up against in the way of cold flow when we used the material.

Q. Did the Thiokol manufacturers tell you any way to bond Thiokol "A" to metal in 1935?

A. No.

(Deposition of Harold H. Klein.)

Q. Or at any other time?

A. Not to my recollection.

Q. In your experience in this field do you know [47] of Thiokol "A" having been used for a sealing element in an oil seal anywhere?

A. Not to my recollection.

Q. And you have been in the business constantly, have you not?

A. You are speaking of 1935 now?

Q. 1935, on up to the present time.

A. Well, I have divorced myself from that type of activity as of my trip east, and that duty was taken over by another. My duties with the company changed at that time.

Q. Now, you made a test of Plaintiff's Exhibit 21. There was a spring on at the time it was tested, was there? A. There was what?

Q. A spring? A. Yes.

Q. A coil spring, a garter spring? A. Yes.

Q. What was the size of the shaft on which that was tested? A. I have not a record of it.

Q. I beg your pardon.

A. I have not a record of it. [48]

Q. But you have such a recollection. Don't you remember?

A. No. I do not remember what size shaft this was tested on.

Q. Well, take a look at Plaintiff's Exhibit 23, Exhibit 316, and see if you can tell from that.

A. I would say it was tested on about a one and nine-sixteenths shaft. That is an estimate.

(Deposition of Harold H. Klein.)

Q. What was the coil diameter of the spring?

A. I do not know, but I can "mike" it for you, if you want me to.

Q. All right. Please do so.

A. That is 134/1000, o. d.

Q. 134/1000? A. Yes.

Q. What was the wire diameter?

A. You will have to get me a pair of pliers if you want to know that. I will have to cut the spring to find out.

Q. Don't you remember that?

A. No, I do not.

Q. Why not? A. Why should I?

Q. Why should you remember these other things [49] you have not thought of for nearly 11 years? I will ask you that one.

A. Well, those are details one does not ordinarily carry in their mind when you are not in direct contact with the work every day. I might answer you in that manner.

Mr. George I. Haight: Yes. That is a very good observation.

The Witness: Thank you.

Mr. George I. Haight: Is there any objection to having the witness determine the wire diameter of the coil?

Mr. Owen: May I ask Mr. Aukers if it can be done by uncoiling the two ends of the spring?

Mr. Aukers: We can do it. It can be done.

Mr. Owen: Why don't you do that?

(Deposition of Harold H. Klein.)

Mr. Batty: I tried to get the spring apart, and I was not able to do so.

Mr. Owen: Is it rusted together?

The Witness: I think I can do it without destroying it, if you want it done.

Mr. Owen: Just describe to us first how you are going to do it. I do not want the exhibit changed any. [50]

The Witness: I am going to put a little tension on it to free the nib, as we call it, and then I am going to uncoil it.

Mr. George I. Haight: All right. I think that is all right, don't you?

Mr. Owen: Yes. That is all right.

The Witness: No. It will not yield.

Mr. Owen: Have one of your men try it, Mr. Haight, and see if he can get it apart.

The Witness: Be careful not to stretch the spring.

Mr. George I. Haight: Off the record.

(Discussion off the record.)

Mr. George I. Haight: Is there any value in the suggestion of taking Plaintiff's Exhibit 22?

Mr. Owen: I am not sure. Mr. Haight, that they are the same weight of spring. I rather doubt if they are.

Mr. George I. Haight: Can you, Mr. Aukers, determine the wire diameter of either of these Plaintiff's Exhibits 21 and 22?

Mr. Aukers: To get the wire diameter you will

(Deposition of Harold H. Klein.)

have to slip it and pull out all the coils, [51] and in that way it would be destroyed. We can count the number of coils and do it that way. We can count the number of coils and from the I. D. and O. D. we can get it very closely.

Q. (By Mr. George I. Haight): Did you use the same springs on each of these exhibits, Plaintiff's Exhibits 21 and 22?

A. No, I do not think so.

Q. Why did you use different springs?

A. Well, we varied our spring tension from time to time. As a matter of fact, we were developing spring tensions at that time for use with synthetic rubbers.

Q. Do you know now that the spring tension on one is different from the spring tension on the other?

A. From my observation of them, they are.

Q. Do you know the length of that spring?

A. The developed length, I do not know.

Q. Do you know whether or not that is different on 21 from what it is on Plaintiff's Exhibit 22?

A. No. It would be a simple matter to get it if we could get them uncoiled, but apparently they are not easy to open.

Q. Do you know what the name of this wire was that you used? A. No.

Q. Or its grade, its temper or any of those things?

A. It was the same wire we were currently using in production on leather seals at that time.

(Deposition of Harold H. Klein.)

Q. Do you know what the radial pressure was on the garter spring installed on the sealing element of the exhibit, Plaintiff's Exhibit 21?

A. No, I do not.

Q. How long would that radial pressure endure in that spring?

A. I cannot answer that one.

Q. It would be different when the seal is on a shaft, from what it is when it is not on a shaft, would it not?

A. Yes.

Q. Now, is it your opinion that this cold flow has been going on from the fall of 1935 up until the present time from Plaintiff's Exhibit 21 and Plaintiff's Exhibit 22?

A. Yes. That is my belief. I think it will [53] continue to go on in the form of disintegration and deterioration.

Q. How much of it would go on during the first three years, let us say from the fall of 1935 to the fall of 1938?

A. I cannot answer that one. You will have to ask our chemist about that.

Q. If it is going on all of the time there would be some during that period would there not?

A. It would be reasonable to assume that.

Q. You have not any idea that there was not any cold flow from 1935 until, let us say, December, 1938, and then the cold flow started, have you?

A. I am not really qualified to answer that accurately.

(Deposition of Harold H. Klein.)

Q. What made you qualified to say it was cold flow that changed the dimensions of this thing, as you say?

A. It is obvious. The condition of the seals illustrates that. The seals illustrate that themselves.

Q. But what makes it obvious to you that it is cold flow, since you just now say you know nothing about it? I want to match those two answers and give [54] you an opportunity to explain it.

A. Will you state that again please?

Q. You said you know nothing about cold flow.

A. I did not say I do not know anything about cold flow, but I am not expert or no chemist on cold flow.

Q. When I asked you the basis of your statement that it was cold flow that has caused what you say is a change in Plaintiff's Exhibit 21 and Plaintiff's Exhibit 22 from 1935 up until the present time——

A. Yes.

Q. ——you said it is due to cold flow.

A. That is right, because we expect a certain amount of that, because the supplier said in their literature that one of the inherent qualities of the material was cold flow, and that naturally we would have to live with it and try to use it.

Q. You knew that at the time you used it in 1935, did you?

A. Yes, sure.

Q. Now, would you expect a different cold flow in Exhibit 21 from that in Exhibit 22?

(Deposition of Harold H. Klein.)

A. Well, one seal was tested and the other was not, so I imagine there would be some difference.

Q. And what difference?

A. Whatever difference the testing temperatures might have on it.

Q. Where would you find the greater cold flow, in 21 or 22?

A. I should say in the one that was tested. What number is that?

Q. 21. A. Yes, 21.

Q. Do you know what the radial pressure on the garter spring was, installed on the sealing element of Plaintiff's Exhibit 21?

A. No, I do not.

Q. Will you look at Plaintiff's Exhibit 21 and tell us the dimension of the sealing lip as you measure it at this time?

A. You mean the i. d., inside diameter?

Q. Yes.

A. I cannot seem to read these figures. May I have that glass a second, please?

This thing varies all over the lot. How accurate do you want this?

Q. Just as accurate as you can give it. [56]

A. All right.

(Discussion off the record.)

A. (Continued): It seems to be about 1.430.

Mr. Owen: What was the dimension?

The Witness: 1.430.

(Deposition of Harold H. Klein.)

Q. (By Mr. George I. Haight): Which dimension is this? A. Inside.

Q. What is the answer?

A. 1.430. It is so ragged that it is hard to get it accurate, absolutely perfect. It is hard to get an absolutely perfect dimension.

Q. Do you in your work use a Vernier?

A. Yes.

Q. You know how to use one? A. Yes.

Q. You know how to use one? A. Sure.

Q. Do you know whether the coil garter springs on Plaintiff's Exhibit 22 and Plaintiff's Exhibit 21 are of the same length? A. No, I do not.

Q. You do not have any recollection about that?

A. No, I do not.

Q. Would a difference in length make a difference [57] in pressure?

A. It so happens that in our development of springs we worked on a per lineal inch tension. That is the way we developed our springs, so many ounces per lineal inch.

Q. How many ounces?

A. That depends upon the size of the seal and what we wanted to do with it.

Q. Well, do you remember what you did in respect to the particular seals here in question?

A. I do not.

Q. Plaintiff's Exhibits 21 and 22?

A. I do not remember the tension at all, exactly.

Q. Going back to Duprene and Thiokol, is there any advantage in Duprene over Thiokol "A"?

A. I do not know.

(Deposition of Harold H. Klein.)

Q. Do you know what difference there is in cold flow between those two materials?

A. No, I do not.

Q. Would you call Thiokol "A" "a composition such as Duprene"?

A. I am not qualified to go into the composition of the two materials.

Q. How is it that you remember so well that you [58] heated the mold in the making of Plaintiff's Exhibits 21 and 22 up to about 200 degrees Fahrenheit? A. What is it?

Q. How do you remember it so well?

A. I remember we had to heat it to cure it, to make the seal.

Q. What did you say you heated it to, to what temperature?

A. I told you that I do not know accurately, but I made a guess of about 250. It would be somewhere between 250 and probably 300; in that neighborhood some place.

Q. Well, about 300 would be a better temperature, would it not?

A. I would not say accurately, but that would be my guess; in that neighborhood some place.

Q. Does its plasticity change with temperature, Thiokol "A"?

A. I think all of them do, with temperature.

Q. As you cool it down, when does it really begin to stiffen within your experience, as you recall it, on Plaintiff's Exhibits 21 and 22?

A. I never made any tests. I do not know.

Mr. George I. Haight: That is all. [59]

(Deposition of Harold H. Klein.)

Redirect Examination

By Mr. Owen:

Q. Mr. Klein, do you know what became of that test report, No. 109, after you left to come to Detroit?

A. No, I do not. As I said, when I returned to move to Detroit, many of the records were lost in the moving of the laboratory, along with some of my instruments.

Q. Do you know whether or not Mr. Johnson ever saw it? A. No, I do not.

Q. I want to clear up, Mr. Klein, in what sense you used the word "imagining" and "imagination." I want to read to you the claim from the Johnson Patent, and ask you whether you or Mr. L. A. Johnson thought of these different things.

Who thought of using "a cup member having a peripheral portion and an axially inwardly offset radial flange"?

A. That was Mr. Johnson.

Q. Who thought of using "a molded resilient sealing member bonded to both sides of said radial flange at said offset so that its outer radial face lies within the radial plane of the cup bottom"?

Mr. George I. Haight: I wish to call the Court's attention to the fact that these questions are most grossly leading. The proper thing is to ask the question, and not lead the witness by reading the claim.

Mr. Owen: I am reading from the claim, Mr. Haight.

(Deposition of Harold H. Klein.)

Mr. George I. Haight: That is what I am objecting to. It is leading. Why don't you ask the witness what elements he conceived and what elements Johnson conceived?

Mr. Owen: I am perfectly willing to ask him that question.

Mr. George I. Haight: Certainly. That is a proper question.

Q. (By Mr. Owen) (Continuing): What elements did you conceive and what elements did Mr. Johnson conceive?

A. My contribution to the thing was the bonding of the element to the case to make a two-piece oil seal out of it.

Q. You mean in the manufacturing of it?

A. That is right.

Q. In making it? [61] A. Yes.

Q. I want to read to you this part of the claim: Who thought of having——

Mr. George I. Haight: I again object. It is perfectly improper. The ground of the objection is, it is plainly leading. You go ahead and do what you please, but the answers will be worthless.

Q. (By Mr. Owen) (Continuing): Who thought of having the molded resilient sealing member bonded to both sides of the radial flange at the offset "so that its outer radial face lies within the radial plane of the cup bottom where it bends inward to form said offset"?

A. That was Mr. Johnson.

Q. That was his idea? A. That is right.

(Deposition of Harold H. Klein.)

Q. Well, then, in what sense did you use the word when you said that in the preparation of your sketch, Exhibit 20, some of your imaginings went into that sketch?

A. That can be illustrated by this sketch of the mold here on this—what do you call it? Exhibit—

Q. Exhibit 20.

A. On Exhibit 20 I show here a section of the mold positioned into the case and contoured like the sealing element as an illustration of how this seal could be molded with two pieces plus a spring—in two pieces plus the garter type spring.

Q. Then as I understand it, your imagination went into the fabrication of it?

A. That is right.

Q. The way of making it?

A. That is right.

Mr. Owen: That is all.

Mr. George I. Haight: Just a minute.

Recross-Examination

By Mr. George I. Haight:

Q. Now, Mr. Klein, you are familiar with this claim of the Johnson Patent, are you?

A. No.

Q. Counsel for plaintiff asked you regarding certain elements. Now, I wish you would tell us without the patent claim before you what elements you presented and what elements Mr. Johnson presented? Just tell us.

A. We were working on the development of the simplest possible type of synthetic oil seal with

(Deposition of Harold H. Klein.)

the least possible number of parts and the lowest possible manufacturing cost.

In connection with that the outer case was suggested by Mr. Johnson and the bonding of the material to the case was presented by myself and illustrated in this sketch, Exhibit 20.

In addition to the contouring of the seal I sketched a cross-section, a small portion of the cross-section of the mold, pointing out the advantages of such a seal and showing how it could be molded. That just about covers it.

Q. Now, what do you mean by "bonded"? That was your idea. What did you mean by "bonded"?

A. It would be a mechanical application to the metal part.

Q. And you used cement for bonding as you made this, is that right?

A. That is right.

Q. And that bonding idea was yours?

A. The application of the material to the steel was mine. The application of synthetic material to the steel was mine. That is, the mechanics of the thing was mine. [64]

Q. The outer case was Johnson's idea?

A. That is right.

Q. Whose idea was it of having an offset flange?

A. Mr. Johnson's.

Q. Did you have any other ideas that you contributed to that structure in addition to the bonding?

(Deposition of Harold H. Klein.)

A. Any other ideas in addition to the application of the synthetic material?

Q. Yes.

A. No. Naturally when you are working as a development man you have all sorts of ideas about a new product, but that was my contribution to this particular development.

Q. How long were you developing this before any tests were made?

A. This particular seal?

Q. Yes.

A. Oh, I think about 30 days.

Q. Did anybody work with you in making that development?

A. Yes. I had help around there.

Mr. George I. Haight: That is all.

Mr. Owen: That is all.

(Deposition closed.) [65]

HUGH T. STEWART

· Direct Examination

By Mr. Owen:

Q. What is your full name and address, Mr. Stewart?

A. Hugh T. Stewart, 1212 Whipple Avenue, Redwood City, California.

George I. Haight: What city?

The Witness: Redwood City.

Q. (By Mr. Owen): By whom are you employed, Mr. Stewart?

(Deposition of Hugh T. Stewart.)

A. National Motor Bearing Company.

Q. In what capacity?

A. Director of Research.

Q. For how long have you worked for them?

A. A year and a half. [67]

Q. By whom were you employed before that?

A. The Arcadia Synthetic Products Division of the Western Felt Works.

Q. What business were they in?

A. They manufactured so-called plastics and synthetic rubber products.

Q. Where did you work before that?

A. I worked for Keasbey & Mattison Company at Ambler, Pennsylvania.

Q. What do they make?

A. Rubber and asbestos goods and brake lining.

Q. What phase of it did you work on?

A. I reorganized their packing department. It involved asbestos textiles and rubber developments.

Q. Where did you work before that?

A. Garlock Packing Company.

Q. What business are they in?

A. They are in the manufacture of mechanical packings and oil seals.

Q. Mechanical what?

A. Packings and oil seals.

Q. Do you remember about what years you were with Garlock?

A. From 1934 until early 1938. [68]

Q. Where were you before you were with Garlock?

A. I was in business for myself.

Q. Whereabouts?

(Deposition of Hugh T. Stewart.)

A. In Jersey City, New Jersey and Union City, New Jersey.

Q. For how long? A. For eight years.

Q. And where were you before that?

A. Bell Telephone laboratories.

Q. Going back to the time you were in business for yourself what was the nature of your business?

A. I made molded asbestos and rubber packings.

Q. When you were with the Bell Telephone Laboratories what years were those?

A. 1923 to 1926, I believe.

Q. What work did you do then?

A. That was on rubber development, primarily, for the Western Electric Division of the Bell Telephone System.

Q. Did you have any experience prior to 1923 with rubber development? A. No.

Q. Have you ever worked with a material known as Thiokol? [69] A. Yes.

Q. Do you remember when you first became acquainted with Thiokol?

A. Well, I am a little hazy on this, but I first met Dr. Patrick, I believe, in 1929.

Q. Who was Dr. Patrick?

A. He was the discoverer or inventor of Thiokol.

Q. Did that have anything to do with your becoming acquainted with Thiokol material?

A. Yes.

Q. Explain what you mean.

A. I got samples at that time to evaluate and see whether it had any possibilities for use in my own business.

(Deposition of Hugh T. Stewart.)

Q. And that was what?

A. The manufacture of asbestos and rubber packings.

Q. What tests, if any, did you make with Thiokol in connection with your own business?

A. Well, my interest at that time was in rubber compounds in solution in the form of cements, and that sort of thing, and my work mainly was in the devising of solvents or obtaining of solvents that would put Thiokol in a cement condition.

Q. Did you ever do any other work with Thiokol?

A. Yes. I have molded Thiokol and skimmed and frictioned Thiokol on cloth. We did quite a little work with Thiokol at Garlock Packing Company.

Q. That was during what years?

A. 1935 to 1938, I believe.

Q. Did you ever do any work with Thiokol "A?"

A. Yes.

Q. Did you ever do any work with Thiokol "A" in granular form?

A. Not at that time. I have since done some work with Thiokol molding powders.

Q. Can you tell from looking at Exhibits 21 and 22 whether or not—or what material they are made of?

A. Well, I would say from the smell of them they are Thiokol "A."

Q. Looking again at Exhibits 21 and 22, did you hear the testimony of Mr. Klein that when those

(Deposition of Hugh T. Stewart.)

were made the radial back face of the sealing member was within or flush with the bottom of the case?

A. In the same plane you mean?

Q. Yes. In the same plane. A. Yes.

Q. Are they in that condition now?

A. No. 21 is not.

Q. What is the condition of No. 21, before you go on and test No. 22?

A. Generally it is badly distorted.

Q. What is the condition of the radial face of the *ceiling* element? What kind of distortion is it? Which way is it moved?

A. It is moved inwardly, and—shall I call it upwardly?"

Q. Inwardly and outwardly, do you mean?

A. Well, out of the plane of the case, yes.

Q. It sticks out beyond the plane of the bottom of the case? A. Yes.

Q. Is that right? A. Yes.

Q. Now, will you look at Exhibit 22 and see what condition that seal is in?

A. The same condition exists there, but to a lesser extent, I would say.

Q. You mean, there is less distortion on Exhibit 22? A. Yes.

Q. Than on Exhibit 21? [72]

A. That is right.

Q. How do you account for that distortion?

A. Well, I believe that the distortion has been caused by the pressure, the force that has been ap-

(Deposition of Hugh T. Stewart.)

plied by this circumferential spring here, which has caused the molded part to cold flow.

Q. Is that true on both exhibits?

A. It becomes more or less set.

Q. Is that true on both Exhibit 21 and Exhibit 22?

A. It is very marked on Exhibit 21. Can I measure this?

Q. Yes. Make any measurements or comments you want. I want the record to be complete on your observations.

A. The distortion of the unit represented by Exhibit 21 is much greater than on Exhibit 22, very much greater.

Q. You say there is very much greater distortion on Exhibit 21 than on 22? A. Yes.

Q. How do you account for that?

A. Well, the previous testimony was that No. 21 had been tested in hot oil, which no doubt accelerated [73] that condition, particularly if the test was above 150 degrees.

Q. Why do you say "150?"

A. Or even 125, for that matter.

Q. Why do you say 150 or 125?

A. Well, Thiokol will cold flow at room temperature and any increase above room temperature just accelerates that property.

Q. Does the presence of the spring have anything to do with cold flow?

A. The force of the spring further accelerates the cold flow.

(Deposition of Hugh T. Stewart.)

Q. Will you take Exhibit 21 first, the one which you say has had the maximum distortion.

A. Yes.

Q. Would you explain what evidence you see there of cold flow, referring to the various parts where you find it in evidence, and what it has done to the various parts of the seal.

A. Well, from looking at the drawing, Exhibit 314——

Q. Which is Exhibit 23?

A. ——which is Exhibit 23, that shows a nominal inside dimension of 1.516.

Q. That is the shaft hole? [74]

A. That is the shaft hole.

Q. Would you check the mold before you go further and see whether or not the mold would have produced a sealing flange with that size of a shaft opening?

A. According to the drawing it should have.

Q. Which drawing are you looking at?

A. Exhibit 315. The same dimension is shown on the mold drawing as on Exhibit 314, so the piece that came out of the mold should be substantially within the tolerances that are shown on there.

Q. What tolerances are shown?

A. Ten thousandths of an inch.

Q. Plus or minus ten thousandths?

A. No. Plus or minus five thousandths; ten thousandths over all.

Q. Will you continue with the measuring you were doing and answer my question?

(Deposition of Hugh T. Stewart.)

A. Well, at one point the i. d. shows 1.296, and you could get almost any variable from that, any variation from that that you want, up to 1.343.

Q. Now, that is because of what?

A. The force applied by that spring, tending to turn this thing inside out.

Q. Turn what thing inside out? [75]

A. The sealing element. The spring wants to pull that rubber down there and the rubber is allowing the spring to do it.

Q. These different dimensions which you just read off are measurements of the opening of that shaft hole in the sealing element, is that correct?

A. Yes.

Q. The measurements vary, and what conclusion do you draw from that?

A. That the force applied by the spring has caused the distortion in the sealing element.

Q. How has that been manifested, if at all, in any other part of the seal?

A. Well, it shows up in the back, and apparently the force of that spring pulling the sealing element inward and downward, or upward, whichever the case is here, makes the rubber cold flow and there is a bulge up here (indicating).

Q. You mean, a bulge at the bend?

A. A bulge at the bend, yes, which tapers down to the case.

Q. Have you prepared just a rough pencil sketch of the cross-section of a seal of that type?

A. Yes. [76]

(Deposition of Hugh T. Stewart.)

Q. Would you mark on there where you are referring to this last bulge? A. This last——

Q. Wait until I give you a pencil. Does anybody have a blue or green pencil?

Mr. Klein: Yes. Blue, green, or red.

Q. (By Mr. Owen, Continued): You are marking with a blue pencil just what, Mr. Stewart?

A. I can probably illustrate on the drawing, if you want that.

Q. Go right ahead.

A. What my idea is regarding the force here.

Q. Yes. Go ahead.

A. One force is in that direction (indicating).

Q. Will you mark that arrow with an "A?"

A. Yes.

Q. What force is that?

A. That is the direct force of the spring.

Q. That is in the direction of the arrow "A?"

A. Yes. That would cause the lip to move in this way (indicating).

Q. You are now making a dotted line indicating a new position, a distorted position of the lip, is [77] that correct? A. That is right.

Q. Now, will you mark that line you have just drawn with the reference numeral "B?"

A. Yes.

Q. Explain just what you mean there by that distortion, and how it has happened.

A. Well, there is very likely a fulcrum at some point here in this rigid metal.

Q. Mark the fulcrum point "F," a large "F."

(Deposition of Hugh T. Stewart.)

A. And the rubber is flowing around that as a center and causing this bulging down here (indicating).

Q. Will you mark a "C" where that bulge is most pronounced? A. Yes.

Q. How far up does that bulge continue on the back face of the seal? Examine Exhibit 21 and tell, if you can.

A. That is a little bit—it is not a uniform bulge.

Q. Can you tell from examining Exhibit 21 why it is not a uniform bulge?

A. Well, this rubber material is cemented to the case so that prevents the metal in intimate—the rubber, [78] I should say, in intimate contact with the metal case from flowing, that adhesive bonding there, so the rubber is tending to flow up over that.

The largest volume of rubber seems to be through this point here (indicating) on this radius.

Q. You mean "C" on the sketch you have made?

A. That is right. That displacement there has taken place outwardly and sloping down to the plane of the case itself.

Q. How do you describe that? What is that due to?

A. It is due primarily to the force of the spring and the tendency of the spring to pull the sealing member inward and downward.

Q. How long would you say that that cold flow has been going on in that seal, Exhibit 21?

A. Well, I would not want to say.

Q. Has it stopped?

(Deposition of Hugh T. Stewart.)

A. Possibly ever since the pressure, the force, has been applied by the spring.

Q. Has it stopped, the cold flow?

A. I could not answer that.

Q. Now, will you look on the inside of Exhibit 21 and see if you find any other evidences of distortion [79] due to cold flow.

A. Well, comparing the shape of the *ceiling* lip with the shape of the mold and the shape of the drawing, Exhibit 314, which shows that it has a 20-degree angle, that is a straight angular surface there, whereas in the molded part it is radiused.

Q. Will you on that drawing, that sketch you just made, indicate the word "radius" where that radius thing is, and indicate that with your blue dotted line?

A. All right.

Q. You have accentuated it, have you, in your sketch?

A. Yes.

Q. Now, will you mark the word "radius" there?

A. Yes.

Q. What did you say that radius is due to?

A. I believe there was some wear or some sloughing at the point of contact with the moving shaft. Some of the rubber material has been abraded from it and reduced the thickness of that section, and by reducing the thickness of the section the effective force of the spring would be much greater to cause distortion.

Q. And that distortion is due to what? [80]

A. The force exerted by the spring.

Q. Now, will you look at the back radial face of

(Deposition of Hugh T. Stewart.)

the sealing element and see if you see there any evidence of distortion due to cold flow?

A. Yes. There are bumps and protrusions of varying heights and some depressions also.

Q. What are these depressions due to?

A. That is probably over one of those holes in the case.

Q. By looking at the inside of the seal opposite one of those depressions, do you get any clue as to what has taken place?

A. There is some distortion of the flange there. In fact, it has come away from the case.

Q. You mean, it has become uncemented?

A. Yes.

Q. What effect could that have on the back face that you say showed a little depression?

A. It is possible that the rubber pulling inwardly is tending to draw that rubber through the small anchor hole, or whatever it is called there.

Q. What is that change in shape due to?

A. Still the force exerted by the spring.

Q. Does Exhibit 21 show any signs of having been buffed after it came out of the mold, on the outer radial face?

A. Well, buffed or ground. There are still particles standing up that have been loosened from the main body by some means or other, either buffing or grinding. It exhibits a rough pitted surface.

Q. Having been in contact with it?

A. I beg your pardon?

(Deposition of Hugh T. Stewart.)

Q. Having been in contact with it?

A. With the grinding.

Q. With the grinding operation?

A. Yes.

Q. Is that correct? A. Yes.

Mr. Owen: This sketch that you have made, and upon which you have made various marks in connection with your testimony with respect to Exhibit 21, I offer in evidence as Plaintiff's Exhibit 25.

(The said document, so offered in evidence, was accordingly marked Plaintiff's Exhibit 25.)

[Plaintiff's Exhibit No. 25 appears in Book of Exhibits.]

Q. (By Mr. Owen): Now, will you take Exhibit 22, the seal that has not been tested, and see whether or not there you find any evidence of distortion, and if you do find it, point it out.

A. Well, the inside diameter of the sealing element has been reduced from that shown on Exhibit 314.

Q. That is, Exhibit 23?

A. Yes, but not to the extent that it has in Exhibit 21. It is entirely possible that the testing of that seal——

Q. You mean, Exhibit 21?

A. Exhibit 21—being in hot oil for thirty days was the reason for the apparent difference between 21 and 22.

Q. You mean, as far as distortion goes?

A. Yes. The acceleration due to heat. The oil

(Deposition of Hugh T. Stewart.)

might not affect it so much as the application of heat, and it being unsupported.

Exhibit 22 follows the same general line as Exhibit 21, except to not as great an extent in any case.

In this particular case the sealing surface shows a radius, too, but a radius that sweeps for practically the full length of that lip.

Mr. Owen: Does anybody have a green pencil that we can make another mark with?

Mr. Klein: Yes.

Q. (By Mr. Owen): Now, would you mark on Exhibit 25 what you say there about that radius extending the full length of the sealing lip, and mark it in green? A. All right.

Q. You are now drawing a green dotted line indicating a change in shape?

A. Yes. That is supposed to be the radius.

Q. Now, will you mark a legend on there in green with a dotted line to your dotted line saying "radius, Exhibit 22"? A. Yes.

Q. Now, what is that change in shape due to over the condition in which it came out of the mold?

A. That is caused by the spring, the force of the spring pulling inward.

Q. And what characteristic of the Thiokol material would have permitted that?

A. The tendency to flow under pressure, sustained pressure.

Q. Now, will you look at the outer radial face of that Exhibit 22 and state whether or not you find there any sign of distortion or change in shape over

(Deposition of Hugh T. Stewart.)

a shape which was flush or within the bottom of the case for the sealing element? A. Yes.

Q. What do you find there?

A. The same condition that exists in Exhibit 21. The material is flowing inwardly and out of the plane of the metal case.

Q. Would you complete that green dotted line that you started there, following the shape of Exhibit 22 as closely as you can? A. Yes.

Q. You are now making a dotted line out towards the bottom of the cup, is that correct?

A. Right.

Q. And that, you say, is due to the flow of the material into a new shape?

A. Due to the force of the spring, yes.

Q. Now, you did not actually measure the size of the shaft opening of that seal, Exhibit 22. Would you do that now, for the record?

A. It is irregular in shape. [86]

Q. You mean, it is not perfectly spherical?

A. It will have to be an approximation.

Q. All right.

A. It is 1.453 at one spot, 1.468 at another and 1.437 at still another point. You can get almost any dimension between those that I have given on it.

Q. What is that distortion due to?

A. The cold flow property of the material, due to the action of the spring force.

Q. Does that seal, Exhibit 22, show any sign of having been buffed on the outer radial face of the sealing element after it was taken out of the mold?

(Deposition of Hugh T. Stewart.)

A. Buffed or ground. The same condition exists here. There are minute pits and raised portions indicating that an abrasive material of some kind was at work on it.

There are lines on here, too, showing it has been ground.

Q. Do those same marks show, if at all, on the bottom of the case, too?

A. There are two marks on the bottom of the case. I would not want to say whether they were marks of the abrasive from the grinding, or marks from the tool that was used in making the case.

Q. Could they be either?

A. They could be either.

Q. Are there, Mr. Stewart, any recognized reference books in this art on synthetic materials?

A. Yes, there are.

Q. Rubber materials? A. Yes.

Q. Do any of them refer to this matter of cold flow and distortion?

A. Almost every independent reference to Thiokol in literature mentions the fact that one of its disadvantages is its tendency to cold flow.

Q. Does your own experience with Thiokol confirm what these different reference books have to say about cold flow? A. Yes.

Q. Do you have with you the Thiokol book put out by the Thiokol Company? A. Yes.

Q. Does that have anything to say about cold flow? A. Yes. [88]

Mr. George I. Haight: What is the date of this book?

(Deposition of Hugh T. Stewart.)

The Witness: I do not know, Mr. Haight. There is no date shown on it.

Q. (By Mr. Owen): When did you get possession of it, about?

A. Oh, I guess about 1937, or 1938.

Q. Did you ever talk with Dr. Patrick, the inventor of Thiokol, about this question of cold flow?

A. Yes. I talked with Dr. Patrick and Dr. Martin.

Q. Does what is in this book confirm what they told you and your own experience told you?

Mr. George I. Haight: You are getting into the field of hearsay. I object to it.

Q. (By Mr. Owen): Go ahead and answer. You can answer that question.

A. What was the question?

Mr. Owen: Read the question.

Q. (Read by the Reporter.) A. Yes.

Q. (By Mr. Owen): What do you find there in the 'Thiokol Instruction [89] Book on cold flow?

A. There is mention here—I might observe that all types of Thiokol with the exception of "RD," I believe it is, show cold flow tendencies.

I am now going to quote from the book here, page FA 4:

"'Thiokol' type 'FA' stocks show remarkably fast and complete come-back from momentary distortion. However, when compressed for long periods of time, especially at elevated temperatures, they exhibit plastic flow. For many applications this can be corrected through design, or through compounding."

(Deposition of Hugh T. Stewart.)

That refers to Type "FA," Thiokol Type "FA" which is a modification of Thiokol "A."

On page FA 10 there is practically a duplication of that statement.

Q. What is the heading of that paragraph on FA 10?

A. "Stocks for Reduced Cold Flow."

Q. What does that say?

A. It says:

"While 'Thiokol' Type 'FA' stocks [90] show very fast come-back from momentary distortion, they tend to flow or take a high set (i. e. cold flow) when held under compression for long periods of time, at atmospheric temperatures. This condition is accentuated at elevated temperatures. Compound can be obtained that will not flow to an excessive amount when pressure is applied to them. The usual practice is to use as high a loading of the semi-reinforcing blacks as is consistent with the properties desired in the finished article."

Q. Now, did you bring with you any other reference books that have reference to this matter of cold flow in Thiokol?

A. Yes. Here is Harry Barron's Modern Synthetic Rubbers, published by D. Van Nostrand Company.

Q. What edition is that?

A. I think it is the Second Edition, 1943. On page 283 in the chapter on Thioplasts, the book states:

(Deposition of Hugh T. Stewart.)

“As already indicated the great snag which has checked the progress of this class of synthetic rubbers is the cold flow. Under [91] any degrees of temperature and pressure for any length of time these materials become distorted. Yet under conditions of instantaneous release they are quite as resilient as rubber. The cold flow is of considerable importance, since it means that the products cannot be used under conditions of tension or compression. It also necessitates the cooling of many types of moldings before extraction, so that there should be no permanent distortion.”

Q. What was the heading of that paragraph you just read?

A. “Thioplasts and Cold Flow.”

Q. Is Thiokol a Thioplast?

A. Yes. It is considered under that heading.

Q. Do you have any other recognized reference books that refer to this problem?

A. There is a book entitled “Plastics” by H. Ronald Fleck, published in 1945 by the Chemical Publishing Company, Inc., and on page 133 it states:

“Thiokols have one other outstanding disadvantage which limits their applicability—a tendency to cold flow. Under conditions [92] of instantaneous release they are as resilient as rubber, but when held for any length of time

(Deposition of Hugh T. Stewart.)

under pressure or load Thiokols become distorted and consequently cannot be used in positions where they would encounter prolonged tension or compression.”

Q. Are you familiar with the tests of the American Society for Testing Materials in connection with rubber materials? A. Yes.

Q. Do they have any recognized test for determining the presence of cold flow in such materials?

A. They call it “set.” There are two methods of determining it. There is the constant deflection method and the constant load method.

Q. What is the constant load method?

A. That is where a specimen of rubber is held under compression by a spring at a constant load for a certain length of time.

To accelerate it, the speed of action, it is usually put in an oven and after a certain elapsed time, whatever the test procedure calls for, it is taken out and the recovery is measured. [93]

Q. Is there any similarity between this test and the condition in which exhibits 21 and 22 have been in the past eleven years?

A. Yes. You have in both of these Exhibits the force applied by the spring, a definite force applied by a spring.

Q. In your opinion is the present shape of Exhibits 21 and 22 due to the cold flow? A. Yes.

Mr. Owen: That is all.

(Deposition of Hugh T. Stewart.)

Cross-Examination

By Mr. George I. Haight:

Q. When were you employed by the Bell Telephone Laboratories? A. From 1922 to 1925.

Q. Was that in New York City?

A. 463 West Street, New York City. At that time the company was known as the Research Department of the Western Electric Company. Bell Telephone Laboratories was a name given later to the organization.

Q. Was Dr. Jewett head of the laboratory at that time? A. Yes. [94]

Q. What work did you do there?

A. I worked with Mr. A. R. Kemp.

Q. What did you work on? A. Rubber.

Q. What were you trying to determine in connection with rubber?

A. They had many problems. They were trying to build electrical characteristics into rubber, flex resistance, compounds to prevent the effect of perspiration on hard rubber telephone receivers and so forth.

Q. That was in connection with materials in the telephone industry being manufactured by Western Electric Company here in Chicago.

A. Yes.

Q. Did you work in any other field while you were with the Bell Telephone Laboratories?

A. I did a little work on paper and insulation, more in comparison to rubber than for any other reason.

(Deposition of Hugh T. Stewart.)

Q. When did you first become acquainted with the use of Thiokol "A" as a sealing element in an oil seal? A. I would say about two weeks ago.

Q. You had never known of Thiokol being used as a sealing element in an oil seal prior to that time?

A. No, sir.

Q. When did you first see Plaintiff's Exhibit 21?

A. That was about two weeks ago in the Court House in San Francisco.

Q. When did you first see the oil seal, Plaintiff's Exhibit 22?

A. At the same time.

Q. When did you enter the employ of the Plaintiff Company?

A. Early October a year ago. It was 1944.

Q. Were you familiar with the hearing in this lawsuit that was had in San Francisco in January of this year? A. No.

Q. You knew nothing about it?

A. No, sir.

Q. When you saw Plaintiff's Exhibits 21 and 22 had you ever been told anything about them prior to that time? A. No. [96]

Q. How did you happen to go there?

A. Mr. Owen called me, at San Francisco.

Q. Did you have any discussion with Mr. Owen about it before you saw the seals?

A. No. I met him in the Court House.

Q. Did you make an examination of them at that time, at the Court House?

A. A casual examination, yes.

(Deposition of Hugh T. Stewart.)

Q. Did you later make a more thorough examination?

A. I looked at them more thoroughly last evening.

Q. Here in Chicago? A. Yes, sir.

Q. Did you make any measurements when you first saw them? A. No.

Q. Did you make any measurements when you saw them here yesterday?

A. Just rough measurements.

Q. Thiokol "A" has always had cold flow, as I understand it, has it not?

A. Yes, it has.

Q. And you knew that from the very beginning?

A. Yes, sir. [97]

Q. You knew that when you first contacted Dr. Patrick? A. No, I did not.

Q. What uses have you put Thiokol "A" to, if any?

A. Well, I found that the best use for it was as a coating on cloth, where cloth would support it and keep it from spreading around.

Q. Any other uses, within your experience?

A. None that have any satisfactory commercial application along the lines I am familiar with, the packing industry.

Q. Are you acquainted with the material known as Duprene? A. Yes.

Q. When did you first become acquainted with that? A. About 1932, I believe.

(Deposition of Hugh T. Stewart.)

Q. What was the occasion of your becoming acquainted with Duprene?

A. Well, in my own business at that time I was interested in all of the new polymers that were being brought out as a binder for powdered metal and asbestos fibres in the material I was making personally [98] at that time, and I had materials submitted to me of all kinds of which I made cements in order to incorporate these other things into it.

Q. Do you know anything about the characteristics of Duprene in respect to cold flow?

A. Some of the Neoprene materials have more of a tendency along that line than others.

The first Neoprene we worked with when it was called Duprene, I believe was Type E, and that did not have a great deal of tendency to cold flow, as I recall it. It did have a tendency to stick to any metal it was in contact with under pressure, and that limited its application.

Q. In view of your acquaintance with such materials, will you look at the drawings of the mold from which the seals, Plaintiff's Exhibits 21 and 22 were made, which are Plaintiff's Exhibit 23, the mold bottom Exhibit 316, and the mold top Exhibit 315.

A. Yes.

Q. In using that mold and making seals like Plaintiff's Exhibits 21 and 22, would there be any shrinkage of the Thiokol material upon its removal from the mold?

(Deposition of Hugh T. Stewart.)

A. There might be a very slight shrinkage. As I understand it—can I qualify this a little bit?

Q. Oh, certainly.

A. These particular seals were molded from Thiokol "A" which had been reacted previously with zinc oxide and then ground and formed into a powder and reformed under heat and pressure.

Any pressure—or rather, any shrinkage that would take place would take place in the original reaction.

There might be a slight shrinkage take place at the temperature coming out of the mold, but it might be only a matter of a thousandth or two in the diameter.

Q. Let us assume that the heat applied to the material in the mold goes up to 250 to 300 degrees Fahrenheit. On cooling of the material or the seal, the oil seal, when removed from the mold would you expect considerable shrinkage?

A. I do not believe I understand your question.

Mr. George I. Haight: I will try to make it clear.

Q. (By Mr. George I. Haight): I am going through, now, the process of manufacturing oil seals, Plaintiff's Exhibits 21 [100] and 22. I am assuming that they are put in the molds we just identified, that they are brought to a temperature for about four minutes of from 250 to 300 degrees; that then they are cooled somewhat and then they are removed.

(Deposition of Hugh T. Stewart.)

Upon that cooling would there be any shrinkage in the seal, which would be made of Thiokol "A"?

A. Made of Thiokol "A," there probably would be, but made from Thiokol "A" mold powder, I doubt that there would be any appreciable shrinkage.

Q. Why the difference?

A. Well, in straight Thiokol "A" which was compounded in the usual manner, you have got to cool that before you remove it from the mold because it is a gassy material and if you opened the mold while the stock was still hot, it would blow and distort, blow itself out of shape.

On the other hand, you can take Thiokol "A" after it has been reacted with zinc oxide and grind it up into granular form, put that back into a mold and reform it again, and no further gassing takes place, so you can remove Thiokol mold powder from a hot mold and not distort it unless [101] you stretch it out of shape deliberately.

Q. Let us assume that when such a seal as Plaintiff's Exhibit 21 or Plaintiff's Exhibit 22 is removed from the mold, you put no spring on it.

What, if anything, will happen to Thiokol "A" material? No pressure applied to it at all.

A. Depending upon the original compounding, it might over a period of time gradually fall of its own weight in the unsupported part of it.

Q. Fall away from the metal?

A. Fall away from the metal, yes.

Q. That is, it would contract?

(Deposition of Hugh T. Stewart.)

A. Well, as I say, it depends upon the compounding. If there were some volatile materials there, some vagrant materials that came off after a period of time, you would have contraction. In order to contract, something has to leave.

Q. Would you call that contraction cold flow?

A. I would want to know more about it before I made a statement.

Q. Will Thiokol "A" cold flow without the application of pressure to it?

A. I do not recall in my experience ever seeing that it did. The reference book here states that it will.

Q. You have been relying on those reference books since you presented them in your testimony, have you not? A. Yes.

Q. That is correct, is it not? A. Yes.

Q. And based upon that it would cold flow and change in its dimensions without the application of any spring pressure, would it not? A. Yes.

Q. In that change would it shrink or expand?

A. You mean, volumetrically, or diametrically?

Q. Any way.

A. I cannot see how it would expand any. If anything, it would shrink.

Q. Then when a spring is applied, it does not shrink; it expands, is that right?

A. It contracts.

Q. Does it contract without the pressure of the spring and also contract with the pressure of the spring?

(Deposition of Hugh T. Stewart.)

A. My opinion is that the spring accelerates the contraction.

Q. Then any cold flow caused in Plaintiff's Exhibits 21 and 22 due to the presence of a spring would effect a contraction of the Thiokol in the material and not an extension, is that right?

A. In dimension.

Q. In dimension? A. Yes.

Q. And in all dimensions?

A. At the point where the spring is the motivating force. Now, if that Thiokol was trying to flow away from the force of that spring, it might move outwardly, not inwardly, at some other point.

Q. But the general result would be a shrinking of the Thiokol material, would it not?

A. Well, I think we are thinking of the term "shrinkage" in two different ways.

I regard shrinkage as a reduction in volume.

Q. That is what I am doing.

A. I know now what you mean. I do not think it would reduce in volume at all, unless something left it, unless there was an evaporation or something [104] there.

Q. That is, you do not think it would compress any more?

A. Well, if you compress it at one point, it has to move out at some other point.

Q. But you said without the application of any spring pressure whatever, it would shrink. That is what you said just a few minutes ago. That is right, is it not? A. Shrink or contract.

(Deposition of Hugh T. Stewart.)

Q. And if it shrinks there will be a change in volume, will there not?

A. Yes. I misunderstood, I think, what——

Q. And that volume would be smaller?

A. No. It would not be, no. I was not speaking of any volumetric change at any time. If I used the word “shrinkage” it was unfortunate.

Q. I understood you to say a while ago that you did not understand in what sense I was using it, and that you were using it in the sense of a change of volume.

A. I said I regard the use of the word “shrinkage” as a change in volume. That is my conception of the word. [105]

Q. And when you were talking about it shrinking, you meant a change in volume?

A. No. I meant a change in dimension.

Q. That is, it has the same volume, but a different shape?

A. Yes.

Q. Is that what you mean?

A. That is right.

Q. Then without the application of any spring—let us get your testimony straight—due to cold flow there would be a change of shape but no change in volume; is that what you now say?

A. Right. Yes, sir.

Q. What shape, in your opinion, would this sealing element assume just through cold flow with the application of no spring?

A. I would not express an opinion, because I do not know.

(Deposition of Hugh T. Stewart.)

Q. Have you ever made any tests to determine how it would still keep the same volume but change in shape without the application of any pressure?

A. You mean, just standing at atmospheric temperature and pressure?

Q. That is right. [106]

A. Well, any unsupported section might collapse slightly.

Q. Just of its own weight?

A. Just of its own weight, just like a candle will do on a warm day.

Q. You know something about oil seals now, do you not?

A. I do not know how much.

Q. Based on what you know, whatever it is, would you consider a material that operates like that operable at all in an oil seal? A. No.

Q. Now, as I understood your direct testimony there were two elements that had to do with this cold flow.

One was the inherent characteristic of Thiokol "A" itself. Another element is spring pressure. Did I get you correctly? A. Yes.

Q. Now, the amount of that spring pressure would be a factor in respect to cold flow, would it not? A. Yes, sir.

Q. Have you examined the springs on Plaintiff's [107] Exhibits 21 and 22 respectively to see if the springs are the same springs?

A. No, I have not.

Q. If you found the spring in Exhibit 21 shorter

(Deposition of Hugh T. Stewart.)

as to its wire length than the spring in Exhibit 22, would you not think that that would account for the greater distortion in Plaintiff's Exhibit 21 than in Plaintiff's Exhibit 22?

A. I am not qualified to answer that.

Mr. George I. Haight: Then I will put it to you this way:

Q. (By Mr. George I. Haight): If you will assume that the spring in Exhibit 21 exerted a greater pressure upon the sealing material than did the spring in Exhibit 22, in your opinion would the distortion of the sealing element be greater or lessor in seal 21 as compared with seal 22?

A. I would say the distortion would be greater.

Q. And if it should be found that the spring in 21 were shorter than the spring in 22, would that account for the difference of greater distortion in 21 over that of 22, in your opinion?

A. Yes, sir.

Q. Now, if we start with a device such as would be made by the mold depicted here in Plaintiff's Exhibit 23, Exhibits 316 and 315, we would have an oil seal in which the radial face of the sealing element would be in a line with the metallic cup bottom, would we not? A. Yes.

Q. And if you say there would be no change in dimensions when we removed it from the mold, the completed article would be the same article that would be represented by the hollow of the mold, would it not?

A. The cavity of the mold, yes.

(Deposition of Hugh T. Stewart.)

Q. Now, if you put on spring pressure, through a garter spring mounted as shown in Plaintiff's Exhibit 21 and Plaintiff's Exhibit 22, that, as I understood your testimony, would extend the face out further; that is right, is it not? A. Yes.

Q. Another factor that would enter into that would be heat, would it not? A. Oh, indeed.

Q. Now, assuming that Plaintiff's Exhibit 21 was tested for a period of thirty days running upon a shaft and that the oil heat was, let us assume, around 190 or 200 degrees Fahrenheit, what effect in your opinion would that have upon the Thiokol material, the Thiokol "A" material of that sealing element?

A. Well, the fact that it was in a testing unit with a shaft running in there, probably prevented the distortion that would take place if you had immersed the seal in hot oil for thirty days with no support. It might have collapsed completely in that length of time.

Q. Would the pressure of the spring while the seal is mounted on the shaft in Plaintiff's Exhibit 21 cause this cold flow you are talking about while it was in operation in the test for thirty days?

A. I think it would.

Q. That would be due to the pressure of the spring and due to the condition of the Thiokol "A" material as effected by the heat, is that right?

A. Right.

Q. So we would have, at the end of that test, a seal in which the shape of the Thiokol "A" ele-

(Deposition of Hugh T. Stewart.)

ment was changed, would we not, at the end of such a test?

A. I feel that you would, yes. [110]

Q. Would the spring during the time of the test tend to move the Thiokol "A" sealing element about the fulcrum that you mentioned in your testimony?

A. May I have that question read?

Mr. George I. Haight: Read the question to the witness, please, Mr. Reporter.

Q. (Read by the Reporter.)

A. No. I am inclined to think that the movement in that direction would not be very great.

Q. (By Mr. George I. Haight): Why not?

A. I do think that the movement would be—if the lip would be extended out along the shaft, I think the movement would be in that direction.

There might be some tendency for it to move down in this direction, but I think the greater tendency would be to flow down that way. (Indicating)

Q. Will you look at Plaintiff's Exhibit 21 and tell us how much, in your opinion, the lip has moved down the shaft line?

A. Well, the spring has pulled it into the point where you cannot tell how much of that was [111] extended in this direction (indicating). It has now been pulled in toward the center.

Q. Will you look at Plaintiff's Exhibit 22, the other seal said not to have been tested, and see if there is any difference in that respect between Plaintiff's Exhibit 21 and Plaintiff's Exhibit 22.

(Deposition of Hugh T. Stewart.)

A. Yes. There is considerable difference in the length of the sealing lip.

It is variable, the lip in Exhibit 21 is longer than the one in Exhibit 22.

Q. Will you put this upon a stub shaft, which I think you will find will fit.

The shaft, you can assume, is of a diameter of one and nine-sixteenths inches.

A. Shall I take this wire off?

Q. Yes. Let the record show the witness is taking a wire that attaches the tag to the Exhibit off, and will replace it.

A. Oh! I broke it.

Q. You broke what?

A. The element split all the way around.

Q. What caused that?

A. Forcing it over this plug. [112]

Q. What does that indicate to you about the condition of the Thiokol "A" material?

A. Poor tear resistance, for one thing. Some embrittlement, probably.

Q. What is that?

A. Some embrittlement, and poor tear resistance.

Q. How about the bonding and fastening of the material to the cup, at the inwardly extending flange?

A. The adhesive bonding?

Q. Yes.

A. It seems to be loosened slightly along the edge here. Whether the bond is loosened any in the unexposed parts, I do not know.

(Deposition of Hugh T. Stewart.)

Q. And if the bond is gone, the whole sealing element collapses, does it not?

You have no fulcrum?

A. If the bond is completely gone, yes.

Q. Then there would be no fulcrum, would there? A. No.

Q. Now, I will not have you do that with Plaintiff's Exhibit 22, because we might affect that exhibit also, so we will leave that alone.

A. All right. [113]

Q. Would an oil temperature of 195 to 200 degrees Fahrenheit during a 30-day test such as you have here described on the seal, Plaintiff's Exhibit 21, soften the Thiokol sealing element?

A. Yes, it would soften it.

Q. It would soften it to such an extent that it would cause the spring to imbed in the Thiokol material?

A. I think the effect would be more from the temperature than from the oil.

Q. And what would be its effect, if any, on causing the spring to imbed?

A. Well, it would leave the impression of the spring in the rubber.

Q. Do you find that in Exhibit 21?

A. Definitely.

Q. Now, you say that in Exhibit 21 the lip of the sealing element was extended. A. Yes.

Q. What in your opinion caused that?

A. The tendency of the Thokol to flow away from the force that was being exerted on it plus

(Deposition of Hugh T. Stewart.)

the wiping action of the shaft itself that was running.

Q. And after that action was done and the [114] test completed, would you expect that deformation to still continue, or is there any stopping point?

A. I never tried to find out.

Q. Well, what is your opinion?

A. I have not any.

Q. Do you think it goes on for years and years and years? A. I could not say.

Q. You do not have an idea that this tendency to cold flow has solved the perpetual motion problem? A. No, I do not.

Q. Would it cold flow at all after the test when it was removed from the shaft?

A. Yes, I think it would.

Q. Would the lip still continue to extend due to cold flow?

A. You mean, along the shaft? In that direction?

Q. Yes, along the shaft.

A. It is possible.

Q. In your opinion it would so continue to extend?

A. Are you speaking now of having a shaft in there at this particular time?

Q. No. You have had it on the shaft for thirty days, and now you have taken it off.

A. Taken it off?

Q. Yes.

(Deposition of Hugh T. Stewart.)

A. What you mean is, it will move in that direction (indicating)?

Q. That is, move in a direction which, if it were on the shaft, would be longitudinal of the shaft.

A. I see what you mean. No, I do not think it would.

Q. It would stop, would it not?

A. It would stop.

Q. Why?

A. Because the shaft was giving it support. The tendency of the spring was to pull this inwardly, but the shaft would not permit it, so it followed longitudinally of the shaft.

Q. If it would stop in that direction, why would it not stop in the other direction?

A. What do you mean?

Q. If this cold flow would stop in one direction, if it would stop longitudinally, why would it not stop in the other direction?

A. We are talking about directions. Which direction do you mean?

Q. We have just been talking about the direction away from the edge of the lip when it was first mounted, and you said that lip started to grow down the shaft. A. That is right.

Q. Now, I am asking you: If that stopped, as you say, after it was removed from the shaft, why would it not stop, the cold flow, in the other direction?

You understand that, do you not?

A. Yes.

Q. Well, answer it then.

(Deposition of Hugh T. Stewart.)

A. There is not any answer to that one.

Q. Why not?

A. Because a different set of forces are in existence at that time. As soon as that shaft is removed, different conditions exist.

Q. Then you say it would move in the other direction, do you?

A. Well, what are the conditions we are talking about? That is what I want to know. [117]

Q. I am talking about the conditions that you had in mind when you gave your direct testimony, so keep those same conditions in mind.

A. I was not talking at that time about having any shaft in here at all. I am not familiar with the application of the seal, the testing, or anything of that kind. I was merely asked to give my opinion of what happened by just looking at these things.

Q. When the seal was removed from the shaft after this thirty day test, was the pressure of the spring upon the sealing element the same as it was when it was on the shaft?

A. No, because the sealing element was no doubt extended over the shaft and the spring pressure would be greater due to increased tension.

Q. And the spring under the heat would imbed in the sealing element, would it not?

A. It shows signs of having done so.

Q. Then it is your idea that the spring will keep right on pressing, is that right?

A. Yes.

(Deposition of Hugh T. Stewart.)

Q. And there is no end to it, is that right?

A. I would not say that. [118]

Q. Is that still expanding or changing shape right now as it lies before you, eleven years afterwards?

A. I could not say as to that.

Q. You do not know?

A. No. I would be inclined to think, though, that as long as there was any tension in the spring, as long as there was no expansion there, there would be pressure until the spring tension was relieved.

Q. Since there is a stoppage of the movement of the lip down the shaft, but it continues in the part of the sealing element to the other side—do you understand me?

A. Yes.

Q. (Continuing): —which, you say, is due to different forces, what are those forces?

A. Well, with the removal of the shaft, the tendency to pull inward is accentuated.

The rubber stock no longer has a shaft to line up against and support it, so when it is removed there is nothing to help keep it from collapsing inwardly.

Q. And there being nothing to prevent it, it does collapse inwardly? [119]

A. Definitely.

Q. And your spring pressure is gone, is it not, if it collapses inwardly?

A. If it collapses as far as it wants to go, yes, if the tension is relieved.

Q. That is what would happen, is it not?

A. Yes.

(Deposition of Hugh T. Stewart.)

Q. So that collapse would occur almost at once, would it not, on removal from the shaft?

A. Not at atmospheric temperautre and pressure, I do not think.

Q. Well, would it take two days or ten days?

A. I would not know.

Q. Would it take three years?

A. I am not qualified to say. I could not estimate at all.

Q. Now, don't you know that whatever would happen in that regard would happen almost at once? It must, must it not?

A. No. I do not agree with that.

Q. If there is a change in the dimension of the sealing element during the test period of thirty days and later you found some more change, how much of the change would be due to the test and how much of the [120] change would be outside of the effects, the direct effects of the test?

A. There is no way to determine that, unless you have observed it at the time.

Q. And it would be just as good an opinion, in your judgment, that the change occurred in the main during the test, as it would that some change occurred after the test, would it not?

Have you an opinion on that either way?

A. Well, comparing the two, I have.

Q. Comparing the two what?

A. The two exhibits here, the one that has been tested and the one that has not.

(Deposition of Hugh T. Stewart.)

Q. The one that has been tested has a somewhat greater change? A. Oh, indeed.

Q. Due to the fact that it was tested?

A. That is right.

Q. And if the other one had been tested in the same way, you would expect the same changes, would you not?

A. Changes along the same line, yes, sir.

Q. But in Plaintiff's Exhibit 22 the spring [121] is not imbedded in the sealing element to the extent it is in 21, is it?

A. It is imbedded in 22 to some extent, but not to the extent it is in 21.

Q. That is, the pressure exerted by the spring on the sealing element in 21 is much less than the pressure exerted by the spring in Plaintiff's Exhibit 22, is that right?

A. Not being familiar with the spring, the physical characteristics of it, I would not know how to answer that.

Q. I will ask you to assume that the spring in Exhibit 21 has 211 coils and that the spring in Exhibit 22 has 227 coils; and I will ask you to assume that the diameter of the wire is the same, .025.

Which spring will exert the greater pressure, the shorter or the longer one?

A. The shorter one.

Q. And when we get through with the test of Exhibit 21 and remove it from the shaft, we have

(Deposition of Hugh T. Stewart.)

a collapse of the material, the spring has been imbedded, and that work is over.

That is right, is it not? [122]

A. I did not quite get that.

Mr. George I. Haight: All right. You did not get it.

Q. (By Mr. George I. Haight): Now, in respect to Exhibit 22, which is the longer spring, we will assume—I just ask you to assume that.

A. Yes.

Q. That was not tested. In your opinion, would that exert a greater pressure upon the untested 22 than the pressure on the tested 21 after it was tested?

A. It would exert less pressure. The spring is more relaxed.

Q. But in 21 the spring is imbedded in the Thiokol material, is it not?

A. Slightly, yes.

Q. And not so much, I think you said, in that Exhibit 22? A. That is right.

Q. Did you take that difference into account also?

A. It has some bearing on it. There is no question about that. [123]

Q. Now since, in your opinion, Thiokol material was bound to cold flow, if you start with a material that is even, the same radial plane as the bottom of the metal cup, you expect that to come out more, do you not?

You expect it to get further away from the cup

(Deposition of Hugh T. Stewart.)

on the radial plane of the Thiokol material, do you not? A. When?

Q. Any time.

A. I am sorry. I do not understand the question. Is that during the molding?

Q. After the device has been made.

A. Yes.

Q. After the device has been made. We will start first with 21.

Now, during the test of 21 there was a change in the material due to the circumstances of the test, which included the action of the spring, the action of the shaft, the action of heat and all of the other elements, if any others, that entered into that test. During that time the Thiokol material's lip extended. That is what you said. A. Yes. [124]

Q. But you do not expect that to keep on growing after the test was over and the spring pressure was removed and the Thiokol material collapsed. That is right, is it not? A. Yes.

Q. But you do expect some movement notwithstanding that condition, with your spring pressure gone, in the rest of the sealing element, do you not?

A. Are you assuming that when the test was completed and this snapped in, there was no more tension of the spring?

Q. I am just taking your testimony, sir. I am assuming nothing. You have come here as an expert upon this, I assume, and I am taking your words, so I will ask you again:

In Plaintiff's Exhibit 21, in respect to that part of the sealing element that you say had a move-

(Deposition of Hugh T. Stewart.)

ment around the fulcrum, we are now clear that your proposition is that in respect to the part on one side of the spring that movement is stopped, but it has not stopped in respect to the part of the sealing element on the other side of the spring.

Let us just stay to something.

A. I did not say that the movement had stopped. When the shaft was removed from there, that thing snapped inwardly.

Q. Yes.

A. If there was still tensional force in that spring, it would continue to push it in and distort that material. That is the point I made.

Q. But that is not true of the lip, is it?

A. I do not know anything about the lip.

Q. Well, you told us very definitely about it a while ago. Do you want to change your testimony?

A. No. I do not want to change my testimony.

Q. Well, leaving the lip out, leaving the lip out then for the moment, let us take the rest of the sealing element, but let us exclude the lip.

That had its growth during the test.

A. That is right.

Q. Now, you said that it started to move around the fulcrum, did you not?

A. Yes.

Q. That is right, is it not?

A. Yes.

Q. O. K. Was that due to spring pressure?

A. Is was due to cold flow.

Q. What was the cold flow due to? [126]

A. I am assuming it was from the spring pressure.

Q. Now, did any other factor, any other energy

(Deposition of Hugh T. Stewart.)

enter into that cold flow, to cause it, except the spring pressure?

A. None that I know of.

Q. And whatever that spring pressure would do would be done within a year or two, would it not?

A. I could not answer that because I do not know.

Q. Would it keep on going for three years?

A. I would not know.

Q. Would you say that it was not all over within a week after the test on Exhibit 21 was completed?

A. If it was preserved at atmospheric temperature and pressure, I do not think it would be.

If it was put in a warm place, it might happen in a day's time.

Q. If it was put in an ordinary safe it would remain just the same unless there was a fire, or something of that sort; that is right, is it not?

A. Yes.

Q. Even if it were Mr. Johnson's safe that would still be true, would it not? [127]

A. I think so.

Mr. George I. Haight: All right. I did not know but what he had a hot safe. Now, Mr. Owen, it is quarter of one. Off the record.

(Discussion off the record.)

(And Thereupon, the further taking of the above-entitled depositions was recessed until 2:00 o'clock p.m.)

Friday, June 7, 1946, 2:00 o'Clock p.m.

HUGH T. STEWART

Cross-Examination

(Continued)

By Mr. Haight:

Q. Will you look at Plaintiff's Exhibit 25 which was offered on the record this morning.

A. Yes.

Q. You have indicated there an arrow at "A." What is that supposed to represent?

A. The line of force exerted by the spring in that direction.

Q. Does that line of force have any effect upon that part of the seal that is immediately to the left of the arrow and above the part that you have marked at the end "F"?

A. I feel that the action of the spring tends to place this section indicated by the letter "A" under compression, and this portion immediately over the end of the metallic insert, if we can call it that, under tension.

Q. So that one part of the sealing element is being compressed and the other is under tension, is that right? A. Yes.

Q. What, in your opinion occurs to the part that is under tension?

A. You probably get a reduction of area at that point. It gradually thins out there, would be my opinion.

Q. Where it is compressed, what occurs?

A. A thickening.

Q. Now, is there any other force, in your opin-

(Deposition of Hugh T. Stewart.)

ion, operating to change the sealing element in any regard other than the pressure of the spring?

A. No. I would not say that there was.

Q. So that if there were no spring there, nothing would happen?

A. Other than the slight tendency to fall inward, due to the weight of this unsupported section here (indicating). It might or might not take place over a long period of time. That would be the natural cold flow.

Q. Have you any idea how much that weight is?

A. No, I have not.

Q. It is a very small weight indeed, is it not?

A. Very small weight, yes.

Q. Do you think it is over an ounce?

A. No. It is not an ounce.

Q. It is less than an ounce? [131] A. Yes.

Mr. Owen: For what area?

The Witness: I assume Mr. Haight means this part that is unsupported here.

Q. (By Mr. Haight): All right.

A. It would be very much less than an ounce.

Q. A thousandth of an ounce?

A. Well, I would roughly assume that the weight of the rubber in there, in a seal of that size—we could probably get 90 of them to the pound, not considering the weight of the case, and if we could roughly assume that half of it would be the weight of the unsupported section, it would be about 1/180ths of a pound.

That is just a pure assumption on my part.

(Deposition of Hugh T. Stewart.)

Q. Now, you have a green line. What does that indicate, upon Plaintiff's Exhibit 25?

A. That is the radius that appears on Exhibit 22, the seal that was not tested.

Q. Now, taking the figure that you have represented there on Plaintiff's Exhibit 25, where you show what you say is the direction of movement, would there be some movement on the first day after the spring was put on?

A. I think there would be some movement almost immediately after the spring was put on.

Q. And also as that movement occurred would there be a little less pressure by the spring?

A. Yes.

Q. And on the second day would there be a little more movement? A. That is right.

Q. And still a little less pressure on the spring.

A. Yes.

Q. Is that correct? A. That is right.

Q. At the end of ten days the spring pressure would be decreasing each day and a little movement would be occurring each day, is that right?

A. Yes.

Q. Have you any opinion as to when this spring would not compress any more?

A. I imagine when the point was reached where the spring was at rest.

Q. When, in your opinion, would that be reached? [133] In the matter of a week?

A. I have not any opinion on that.

(Deposition of Hugh T. Stewart.)

Q. You would not know whether it would be a week or a year? A. No, I would not.

Mr. George I. Haight: All right.

Q. (By Mr. George I. Haight): Did you hear the testimony about the use of plibond cement this morning? A. Yes.

Q. Are you familiar with that?

A. Yes, I am.

Q. When did you first become familiar with that? A. Not over three years ago.

Q. It was not on the market until 1940, was it?

A. I do not believe that it was, no. It is a Goodyear product.

Q. What is the nature of that, if you know?

A. It has never been disclosed, but I have formed an opinion as to what some of the things are that are in there.

There is phenolic resin, for one thing. There is vinylite resin. I believe there is [134] also butadine, a butadine polymer.

Q. The same combination that the manufacturers of shoes use for their cement, is that not correct?

A. Yes. I think so. There are a number of them on the market.

Q. Now, will you look again at Plaintiff's Exhibit 22. A. Yes.

Q. Let us look at the radial face of this sealing member, at the top. Do you notice any movement that has seemingly occurred around the edges of that material anywhere?

(Deposition of Hugh T. Stewart.)

A. There is some brown material there. That, I assume, is the cement that was used, and that is exposed. Q. Yes.

A. Whether that has been exposed by grinding or whether it was exposed by movement of the rubber itself away from the cement, I cannot tell.

Q. There is not any way you can tell whether there has been any movement there or not, is there?

A. No. I cannot tell.

Q. How about the middle of that same area, toward the hole in the center? [135]

Do you observe anything that indicates there has been any movement of that?

A. No. I do not see any indication.

Q. That is true across that entire face, is it not?

A. There is some—there are some blemishes on there. It is difficult to say just what they are.

Q. It might be due to bad bond, might it not, or the lack of it?

A. I am sure I would not know.

Q. You testified on your direct examination that this material tends to flow under sustained pressure.

When the pressure is no longer sustained there is no more flow. That is right, is it not?

A. Yes.

Q. Did you ever successfully bond Thiokol "A" to metal?

A. I do not recall that I ever tried to.

Q. Can you find me, conveniently, that part of the Barron book that you referred to?

A. Yes.

(Deposition of Hugh T. Stewart.)

Q. Now, I will quote a sentence from the part which I understood you read, speaking of Thioplasts and cold flow:

“Under any degrees of temperature and pressure for any length of time these materials become distorted.”

You agree to that, do you? A. Yes, sir.

Q. That has always been true of Thiokol “A,” has it not?

A. All that I have ever known about.

Q. You said in your direct examination something with regard to the tolerances that you noticed upon Plaintiff’s Exhibit 23, and particularly Exhibit 314 thereof. What is the range of tolerances there?

A. On the inside diameter it runs from 1.511 inches to 1.521 inches.

Q. And you think those are perfectly fair tolerances to allow?

A. In the light of present day practices, I do not.

Q. What tolerances would you allow in the light of present day practices?

A. We maintain our tolerances at five thousandths of an inch; two and one-half thousands each way. [137]

Q. In view of this cold flow you have been talking about, as you have illustrated it in Plaintiff’s Exhibit 25, that material could not possibly stay within those tolerances could it? A. No.

Q. In other words, with that material you could not make and have for more than a few minutes

(Deposition of Hugh T. Stewart.)

after you put the spring on, the structure with the tolerances that is illustrated in the drawing to which I have just referred, could you? A. No.

Q. What? A. No.

Q. You read from another book—I have forgotten which one—but the note that I got indicates that it said something about cold flow being a great snag in materials of that kind.

Is that the same book?

A. I think that is Fleck's.

Q. Fleck's? A. Yes.

Q. Will you find that one, please, if you can conveniently?

A. Yes. It is right at the top of the page there.

Mr. George I. Haight: Thank you. This is the Fleck book on plastics, published in 1945, to which the witness referred on his direct examination.

Q. (By Mr. George I. Haight): This says:

“Thiokols have one other outstanding disadvantage which limits their applicability—a tendency to cold flow. Under conditions of instantaneous release they are as resilient as rubber, but when held for any length of time under pressure or load Thiokols become distorted and consequently cannot be used in positions where they would encounter prolonged tension or compression.”

That quite rules them out for oil seals, does it not? A. Indeed it does.

Q. And this is speaking of Thiokols way up in 1945, is it not? A. Yes.

(Deposition of Hugh T. Stewart.)

Q. And the Thiokol "A" of 1935 was much worse, was it not?

A. They have learned a great deal about them since. [139]

Q. Yes, but it was much worse?

A. Oh, yes.

Q. You said something about tests of the American Society of Engineers—was that the organization?

A. The American Society for Testing Materials.

Q. The American Society of Testing Materials?

A. The American Society for Testing Materials.

Q. You said somebody called something "set." What was that?

A. Well, what we are talking about as being distortion, in the American Society for Testing Materials' book of Standard Methods of Testing, they call that "set" in a rubber compound.

Q. By that they mean permanent set, do they not?

A. Yes. That is true.

Mr. George I. Haight: Off the record.

(Discussion off the record.)

Mr. George I. Haight: That is the end of the cross-examination.

Redirect Examination

By Mr. Owen:

Q. Mr. Stewart, during your cross-examination you were handed a stub shaft and asked to shove Exhibit 21 onto that shaft. [140]

(Deposition of Hugh T. Stewart.)

Will you describe what happened when you did that?

A. The sealing element split. I should have had more respect for its age.

Q. What do you mean by "age"? What does that have to do with it?

A. Well, any stock that is lying around for eleven years would not have very much life in it, and I stretched it beyond its elastic limit.

Q. During your cross-examination about this Exhibit 21, your attention was called to the fact that in some of the places the sealing element has pulled loose from its bond with the case, and I believe Mr. Haight asked if that did not mean that the fulcruming point "F" in Exhibit 25 would have been destroyed. I think you answered "Yes" to that question.

That is right, is it not? A. Yes.

Q. What takes place when that fulcruming point is destroyed so far as cold flow and distortion are concerned, and if you can illustrate it by Exhibit 21, please do so.

A. Well, the same thing would happen as if the metal insert was not present. It would just fall away gradually without any stopping effect from the presence of the metal insert.

Q. What effect would that have on the sealing face, the sealing material in Exhibit 25 just to the left of the perforation or anchoring hole?

A. I do not think I understand that Mr. Owen.
Mr. Owen: Read the question.

Q. (Read by the Reporter.)

(Deposition of Hugh T. Stewart.)

Q. (By Mr. Owen): In answering the question you can look at Exhibit 21 and see what the effect has been.

A. It seems to be pulling away here, pulling inwardly. That is on the right-hand side.

Q. That is on the right-hand side. Now, what has happened on the left-hand side?

A. It has thickened at this point.

Q. You mean, it has thickened opposite the point "F" on Exhibit 25?

A. I probably should not say "thickened." It is stepped out beyond this plane.

Q. Beyond the plane of the bottom?

A. Yes.

Q. Do you see any evidences of any material having moved through the anchoring hole in the steel member?

A. There are a couple of depressions, three, I believe, that may be immediately above those anchoring holes there showing the tendency of the rubber to want to pull through from this point (indicating).

Q. You mean, from the left to the right on Exhibit 25? A. Yes.

Q. Through the anchor hole?

A. There are some depressions there that could be over those holes.

I have no way of telling whether they are or not.

Q. Well, if and when there is any breaking of the bond of the sealing element in connection with

(Deposition of Hugh T. Stewart.)

the internal metal flange to which it is attached, does that stop or affect in any way the continuance of the cold flow?

A. I would believe that the tendency to distort would be greater if that bond were released. That is bound to hold it back, where it is bonded.

Mr. Owen: That is all.

Mr. George I. Haight: That is all. [143]

(Deposition closed.) [144]

Mr. Owen: There is just one question I would like to ask Mr. Klein.

HAROLD H. KLEIN

Direct Examination

By Mr. Owen:

Q. Mr. Klein, you are the same Harold H. Klein who has been previously sworn and testified here today? A. Yes.

Q. You were present during the cross-examination of Mr. Stewart at which time he was asked to shove Exhibit 21 onto a short stub shaft produced by the defendant, which produced the split in the sealing member? A. Yes.

Q. Was that split there when you took the seal off at the end of its test? [145]

A. No. The seal was examined before putting it away, and it was not split at that time.

Mr. Owen: That is all.

(Deposition of Harold H. Klein.)

Cross-Examination

By Mr. George I. Haight:

Q. That shaft, however, when you caliper it is the same size as the one that is shown in Plaintiff's Exhibit 23, is it no?

A. There is no shaft shown here.

Q. What is the diameter of the shaft for which this is designed according to the drawing Plaintiff's Exhibit 23?

A. I have no record of the shaft size, but I assume it was a one and nine-sixteenths shaft.

Q. Will you caliper that and see if it is not one and nine-sixteenths?

A. That is right. It is one and nine-sixteenths.
Mr. George I. Haight: That is all.

Mr. Owen: That is all.

(Deposition closed.)

Mr. Owen: That is all of our testimony here today, Mr. Haight.

Mr. George I. Haight: You have not anything more to offer?

Mr. Owen: No.

Mr. George I. Haight: I simply want to show the dimensions of those springs in Plaintiff's Exhibits 21 and 22.

Mr. Owen: What?

Mr. George I. Haight: I want to show the dimensions of those springs in Plaintiff's Exhibits 21 and 22. I will ask that Mr. Batty be sworn. [148]

STANLEY C. BATTY

Direct Examination

By Mr. George I. Haight:

Q. Will you state your name, please?

A. Stanley C. Batty.

Q. Where do you reside, Mr. Batty?

A. At Melrose Park, Illinois.

Q. What is your occupation?

A. I am chief testing engineer for the Victor Manufacturing & Gasket Company.

Q. How long have you been with that company?

A. Nearly three years.

Q. How long in that capacity you have stated?

A. Nearly three years.

Q. Do you have any degrees from any college?

A. Yes. [149]

Q. What college?

A. Lewis Institute.

Q. And what degree?

A. Bachelor of Science in Mechanical Engineering.

Q. When did you receive that degree?

A. In 1938.

Q. Very generally what has been your experience?

A. I have worked for the American Can Company as analytical chemist and also as an experimenter on rubber cements for tin cans.

With this particular company my experience has been with oil seals, testing.

(Deposition of Stanley C. Batty.)

Q. Are you familiar with Plaintiff's Exhibits 21 and 22 that have been produced here?

A. Yes, I am.

Q. Have you made an observation of the springs appearing thereon? A. Yes sir, I have.

Q. Have you made any measurements of those springs? A. Yes.

Q. When did you make those measurements?

A. I made those measurements at this meeting.

Q. Did you ever see those before you came here today? [150] A. No, sir.

Q. Will you tell what measurements you took and the results, respectively, on Plaintiffs' Exhibits 21 and 22; and also tell us how you made those measurements?

A. On Exhibit 21 I counted the number of coils in the spring and found that there were 211 coils.

I removed the spring from the seal and measured the inside diameter of the spring with the Vernier caliper and found that the measurements varied between 1.654 to 1.640, making an average inside diameter of the spring of 1.647.

I then measured the diameter of the coil of the spring with a micrometer. This measured 0.134.

I then ascertained the diameter of the wire that was used, by counting the number of coils per inch of length. There were 40 coils to one inch, which corresponds to a wire diameter of 0.025.

I then took Exhibit No. 22 and counted the number of coils in that spring. There were 227 coils. I

(Deposition of Stanley C. Batty.)

then measured the inside diameter of that spring. The inside diameter varied between 1.792 to 1.746, making an average inside diameter of 1.769 inches.

I then measured the diameter of the coil of that spring. The measurement was 0.134. I then ascertained the diameter of the wire used in that spring. There were 40 coils to the inch, making a wire diameter of 0.025.

Mr. Haight: You may cross-examine.

Mr. Owen: No cross-examination, Mr. Haight.

Mr. George I. Haight: That is all I have.

(Deposition closed.)

Mr. Owen: Off the record.

(Discussion outside the record.)

Mr. George I. Haight: Let the record show it is agreed between counsel that the signatures to the depositions are waived, and the reporter will send them on to the Court.

Mr. Owen: The original to the clerk.

Mr. George I. Haight: Yes.

Mr. Owen: And I will return the exhibits which are out on a receipt to me.

Mr. George I. Haight: Yes.

Mr. Owen: This concludes the depositions.

[Endorsed]: Filed June 15, 1946. [153]

[Endorsed]: No. 11631. United States Circuit Court of Appeals for the Ninth Circuit. National Motor Bearing Co., Inc., a Corporation, Appellant, vs. Chanslor & Lyon Co., a Corporation, Appellee. Transcript of Record. Upon Appeal from the District Court of the United States for the Northern District of California, Southern Division.

Filed May 15, 1947.

/s/ PAUL P. O'BRIEN,
Clerk of the United States Circuit Court of Appeals
for the Ninth Circuit.

In the United States Circuit Court of Appeals
for the Ninth Circuit

No. 11631

NATIONAL MOTOR BEARING CO., INC., a
corporation,

Appellant,

vs.

CHANSLOR & LYON CO., a Corporation,

Appellee.

STATEMENT OF POINTS UNDER RULE
19 (6) OF THIS COURT

The points relied upon in this appeal are:

1. That the evidence is insufficient to support the District Court's Memorandum of September

27, 1946; or its Findings VI, VII, and VIII and Conclusions of Law II, III, and IV; or its Judgment dated November 29, 1946 holding the claims invalid and finding laches.

2. That the evidence, when examined in the light of the uniform decisions of this Court, shows that the patent discloses and claims a meritorious and valid invention.
3. That defendant's device infringes the claim in suit and plaintiff is entitled to the relief prayed for.

Wherefore, appellant prays that the Judgment entered herein be reversed with directions to the Court below to proceed with an accounting and other relief appropriate to be given appellant, with the costs of this appeal to appellant.

Dated: May 28, 1947.

/s/ A. DONHAM OWEN,
Attorney for Appellant.

Two copies of the foregoing Statement of Points have been this day mailed to Messrs. Boyken, Mohler & Beckley, counsel for Appellee, at their Crocker Building address in San Francisco, Calif.

/s/ A. DONHAM OWEN.

[Endorsed]: Filed May 29, 1947.

[Title of Circuit Court of Appeals and Cause.]

DESIGNATION ON APPEAL UNDER RULE
19 (6) OF THIS COURT

Appellants hereby designate the parts of the record which they think necessary for the consideration of the appeal, said parts to be printed from the record, proceedings and evidence contained in the original certified record transmitted by the Clerk of the United States District Court for the Northern District of California, Southern Division, pursuant to the order of March .., 1947.

1. Bill of Complaint—as corrected by Nov. 10, 1944, stipulation.

2. Answer of Defendant.

3. Motion for Further and Better Particulars.

4. Plaintiff's Bill of Particulars with exhibit attached.

5. Notice of Clerk that case will appear on the calendar January 8, 1945 to be set for trial.

6. Affidavit filed January 8, 1945 re setting for trial.

7. Stipulation resetting trial date.

8. Notice under U. S. Code Title 35, Sec. 69.

9. Motion for Permission to Take Proofs as to Defendant's Unpleaded So-called Victor Anticipation.

10. Affidavit re above motion.

11. Memorandum in opposition to plaintiff's motion to Take Additional Proofs.

12. Order Regarding Opening of Proofs.
13. Memorandum decision, September 27, 1946.
14. Court's Findings of Fact and Conclusions of Law filed November 29, 1946.
15. Judgment, filed November 29, 1946.
16. Defendant's Proposed Findings of Fact and Conclusions of Law filed October 16, 1946.
17. Plaintiff's Proposed Corrections to Findings filed November 14, 1946.
18. Notice of Appeal Under Rule 73 (b).
19. Reporter's Transcript (3 vols., pages 1 to 38, 50 to 274a) with the following omissions:
 - Page 2, line 5 to page 37, line 1, inclusive;
 - Page 38, line 7 to page 51, line 5, inclusive;
 - Page 94, line 24 to page 96, line 23, inclusive;
 - Page 97, line 2 to page 97, line 6, inclusive.
20. Concise Statement of Points under Rule 19 (6) of this court.
21. This Designation on appeal under Rule 19 (6) of this court.
22. Defendant's depositions of Remi J. Gits, Fred A. Reeves, James Zap and Beatriet M. Krejci taken in Chicago on October 4, 1945 to be printed and bound with the trial transcript with omission of the unnecessary notarial data on pages 1 to 7, 75, 76, 95, 100, 101, 103, 106 to 109, inclusive.
23. Defendant's depositions of Fred L. Haushalter and G. L. Tarbox taken at Toledo on October 5, 1945 to be printed and bound with the trial transcript with omission of the notarial certificate.

24. Plaintiff's depositions of Harold H. Klein and Hugh T. Stewart and defendant's deposition of Stanley C. Batty taken in Chicago on June 7, 1946 to be printed and bound with the trial transcript with omission of the unnecessary notarial data on pages 1 to 4, 66, 67, 129, 144, 145, 146, 147, 149, 152, 154 to 157, inclusive.

25. Order for Transmittal of Original Exhibits.

26. The following designated plaintiff's exhibits, or portions thereof, to be contained in the Book of Exhibits:

1, 3, 6, 7, 8, 9, 10, 15 (page 51 only), 17, 20, 23, 24, 25 (this exhibit may be found bound in by reporter as page 83 of the Klein deposition.)

27. The following designated defendant's Exhibits, or portions thereof, to be contained in the Book of Exhibits:

B, C, F, H, I, J, K, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, BB, CC, DD, EE, FF, AAA (omit duplicating the printed copy of pat. 2,146,677 and its drawings as they constitute plaintiff's Exhibit 1), AAB (this includes copies of 24 patents which counsel have ordered from the Patent Office and will supply to the Clerk, along with Exhibits 1, 17, 24, AAC and AAD which are also patents), AAC, AAD, AAF, AAG, AAH.

/s/ A. DONHAM OWEN,
Counsel for Appellant.

A copy of the foregoing Designation on Appeal has been served on counsel for Appellee A. W.

Boyken, Esq., by mailing two copies of the same to his office in the Crocker Building, San Francisco, California, this 28th day of May, 1947.

/s/ A. DONHAM OWEN.

[Endorsed]: Filed May 29, 1947.

[Title of Circuit Court of Appeals and Cause.]

DESIGNATION BY APPELLEE OF ADDITIONAL PORTIONS OF RECORD TO BE PRINTED UNDER RULE 19 (6)

Appellee designates the following matter to be included and printed in the record on appeal in addition to the matters designated by appellant:

1. Cover page of plaintiff's Exhibit 11 (need not be reproduced in color).

Dated: June 6, 1947.

BOYKEN, MOHLER &
BECKLEY,

/s/ A. W. BOYKEN,

/s/ W. BRUCE BECKLEY,

Attorneys for Appellee.

Receipt of a copy of the foregoing acknowledged this 6th day of June, 1947.

/s/ A. DONHAM OWEN,

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